

Understanding the Global Names Architecture (GNA)

**Richard L. Pyle
Bishop Museum
iDigBio Workshop
27 March 2014**



Species 2000

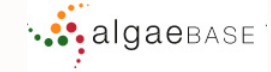
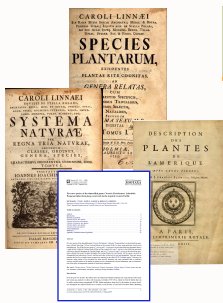


ATLAS OF LIVING AUSTRALIA sharing biodiversity knowledge



Where Are Biodiversity Names Data?

connecting information



A Global Names Architecture



Species 2000



Catalog of Fishes



“*P. nainal* (Rochebrune, 1880)”

“*Pomatomus saltatrix* (L.)”

“*Pomatomus conidens* (Castelnau, 1861)”

“*Pomatomus saltatrix*” “*G. saltator* L.”

“*Pom. salt.*” “*Pomatomus tubulus* (Saville-Kent, 1893)”

“*G. saltatrix*” “*Pomatomus saltator*”

“*Pomatomus pallasii* (Eichwald, 1831)” “*P. saltator*”

“*P. saltator*” “*Gasterosteus saltatrix* Linn., 1766”

“*Pomatomus mediterraneus* (Rafinesque, 1810)”

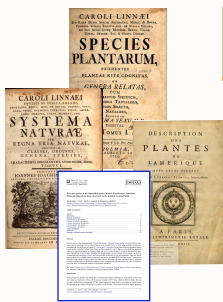
“*Pomatomus saltator* (Linnaeus 1766)”

“*Pomatomus heptacanthus* (Lacépède, 1801)”

“*P. skib* Lacépède, 1802” “*Gasterosteus Sallatrix*”

“*Gasterosteus saltator* Linnaeus”

“*P. lophar* (Suckow)”



A Global Names Architecture

Rationale

- **Taxon Names are the fundamental link among virtually all biodiversity information.**
- **Biodiversity Information relates to species concepts, but data resources are usually tied to text-string names.**
- **Text-string names are difficult to cross-link due to spelling variations, different genus-species combinations, homonyms, synonyms, etc.**
- **Linking text-string names to concepts requires source-based (literature-based) approach.**
- **The key challenge is to cross-link thousands of biodiversity datasets through taxon concepts, using only text-string names.**

A Global Names Architecture

History

<u>Meeting</u>	<u>Date</u>	<u>Location</u>	<u>Topic / Purpose</u>
Pre Nomina	February 2007	Woods Hole	Conceptual
Nomina I	February 2007	Crete	Conceptual
Nomina II	April 2008	Woods Hole	Establishment
Nomina III	October 2008	Margaret River	Core Architecture
Nomina IV	May 2009	Woods Hole	Fuzzy Matching
Nomina V	August 2009	Woods Hole	Taxonomy Merging
Nomina VI	February 2010	Santa Cruz	Roadmap / Data Model
Nomina VII	September 2010	Woods Hole	Public Discussion (TDWG)
Nomina VIII	November 2010	Christchurch	Data Model / IPNI
Nomina IX	October 2010	New Orleans	Priorities (TDWG)
Nomina X	February 2012	Honolulu	Data Model / IF
Nomina XI	March 2012	Honolulu	Infrastructure
Nomina XII	March 2013	Honolulu	BHL / IPNI / IF Integration
Nomina XIII	April 2013	Tempe	Copyright Implications
Nomina XIV	October 2013	Sofia / Florence	Publishers / TDWG

Website: <http://globalnames.org/>

A Global Names Architecture

Funding & Support



National Science Foundation

BiSciCol (DBI-0956415)

GNA (DBI-1062441)



Encyclopedia of Life



GBIF



PBIN / NBII

Various others (e.g., NOAA, other NSF projects)

More NSF & EU Proposals in Process

Partners & Governance

CoL (Species2000 / ITIS), EOL, BHL, GBIF, IPNI, Index Fungorum, ICZN / ZooBank, Landcare Research, MOBOT / Tropicos, Bishop Museum, WHOI, IRMNG, PESI, ALA (and numerous others)

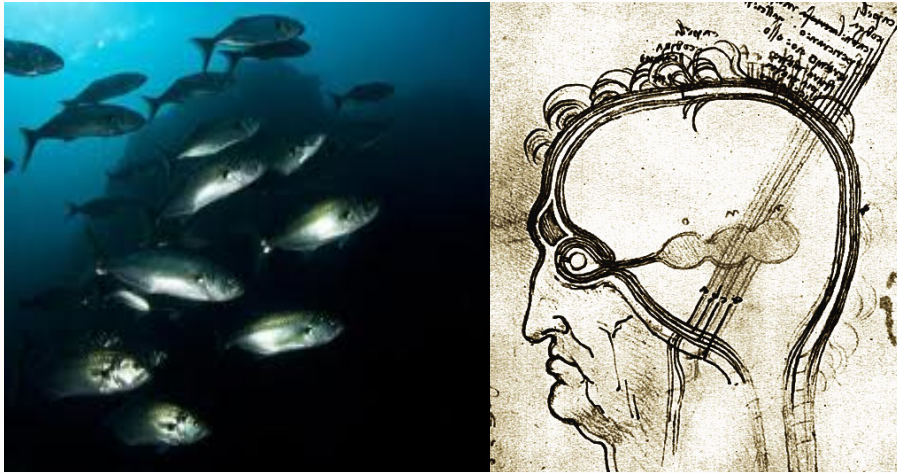
Global Names Architecture Advisory Panel (GNAAP)

A Global Names Architecture

What GNA is **NOT**

“YADD” (Yet Another Damn Database)

What GNA **IS** (...intended to be...)



“*Pomatomus saltator* Linn.”

Easy for a human;
Hard for a computer

A Global Names Architecture

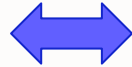
What GNA is **NOT**

“YADD” (Yet Another Damn Database)

What GNA **IS** (...intended to be...)



“*Pomatomus saltator* Linn.”



FFF7160A-372D-40E9-9611-23AF5D9EAC4C

Easy for a human;
Hard for a computer

Hard for a human;
Easy for a computer

<http://idigbio.org>



128.127.150.136

A Global Names Architecture

Data Components

Global Names Index (GNI)

- Database and services optimized for taxon names represented as raw text strings. (“**Dirty Bucket**”)
- ~17+ million text strings
- Parsing Services
- Lexical Grouping
- Links back to sources
- Developed at Woods Hole

The screenshot shows the Global Names Index (GNI) website interface. At the top, there are navigation links for 'Index', 'Repositories', and 'Name Parser'. The main header includes the GNI logo and the text 'Global Names Index BETA' and 'Scientific Names Exchange (about)'. Below this is the 'Index of Scientific Names' section, which states 'Index of scientific names provided by all Name Repositories (17,275,622 name strings total)'. A search bar is present with a 'Search' button and a 'Help' link. Below the search bar is a list of letters 'A B C D E F G H I J K L M N O P Q R S T U V W X Y Z'. The search results show 'Results 1 - 30 of total 47 for 'ns:AAA*''.

The list of results includes:

- « Previous 1 2 Next »
- Aaaba
- Aaaba Bellamy 2002
- Aaaba Bellamy, 2002
- Aaaba de Laubenfels 1936
- Aaaba fossicollis
- Aaaba fossicollis (Kerremans, 1903)
- Aaaba nodosus
- Aaaba nodosus (Kerremans, 1898)
- Aaabat
- Aaadonta
- Aaadonta angaurana
- Aaadonta angaurana Solem 1976**
- Aaadonta constricta
- Aaadonta constricta (Semper 1874)
- Aaadonta constricta babelthuapi
- Aaadonta constricta babelthuapi Solem 1976
- Aaadonta constricta komakanensis
- Aaadonta constricta komakanensis Solem 1976
- Aaadonta fuscozonata
- Aaadonta fuscozonata (Beddome 1889)
- Aaadonta fuscozonata depressa
- Aaadonta fuscozonata depressa Solem 1976
- Aaadonta irregularis
- Aaadonta irregularis (Semper 1874)
- Aaadonta kinlochi
- Aaadonta kinlochi Solem 1976
- Aaadonta pelewana
- Aaadonta pelewana Solem 1976
- Aaadonta Solem 1976
- Aaadonta Solem, 1976

The detailed view for 'Aaadonta angaurana Solem 1976' is shown on the right. It includes a 'Parsed information (hide)' section with the following data:

- scientificName
- parser_version: 0.7.3
- verbatim: Aaadonta angaurana Solem 1976
- hybrid: false
- normalized: Aaadonta angaurana Solem 1976
- details
 - genus
 - string: Aaadonta
 - species
 - basionymAuthorTeam
 - year: 1976
 - authorTeam: Solem
 - author Solem
 - authorship: Solem 1976
 - string: angaurana
- parser_run: 1
- canonical: Aaadonta angaurana
- positions
 - 0 genus, 8
 - 19 author_word, 24
 - 25 year, 29
 - 9 species, 18
- parsed: true

Below the parsed information is a 'Lexical groups' section:

- Aaadonta angaurana
- Aaadonta angaurana Solem 1976

At the bottom, there is a table with the following structure:

Logo	Data Source	Records #
	Index to Organism Names	1 record

A Global Names Architecture

Data Components

Global Names Index (GNI)

- Database and services optimized for taxon names represented as raw text strings. (“**Dirty Bucket**”)
- ~17+ million text strings
- Parsing Services
- Lexical Grouping
- Links back to sources
- Developed at Woods Hole

Global Names Usage Bank (GNUB)

- Database and services optimized for taxon names represented as “curated” Taxon Name Usages. (“**Clean Bucket**”)
- >70K Agents
- >73K References
- >523K Taxon Name Usages (>186K Protonyms)
- Developed at Bishop Museum

BELONOPERCA CHABANAUDI, new species

Depth $3\frac{1}{5}$ to $3\frac{1}{3}$; head $2\frac{1}{4}$ to $2\frac{2}{5}$; snout 3 to $3\frac{1}{8}$. Snout 3 in head from snout tip; eye $5\frac{1}{4}$ to $5\frac{1}{3}$, $1\frac{3}{4}$ to $1\frac{4}{5}$ in snout, subequal with interorbital; maxillary reaches $\frac{3}{5}$ to $\frac{2}{3}$ in eye, expansion $1\frac{1}{2}$ in eye, length 2 to $2\frac{1}{8}$ in head from snout tip; teeth villiform, in bands in jaws, on vomer and palatines; tongue slender, toothless; preopercle edge strongly denticulate, ridge entire, distinct; opercular spines 3, equidistant, median most posterior; interopercle and subopercle denticulate. Gill rakers 6+15, lanceolate, robust, greater than gill rakers or equal $1\frac{1}{2}$ in eye.

Scales 66 to 68 in lateral line to caudal base and 6 or 7 more on latter; 11 scales above lateral line, 34 below, 25 to 27 predorsal, 12 rows across cheek to preopercle ridge. Fins all scaleless, except cau-

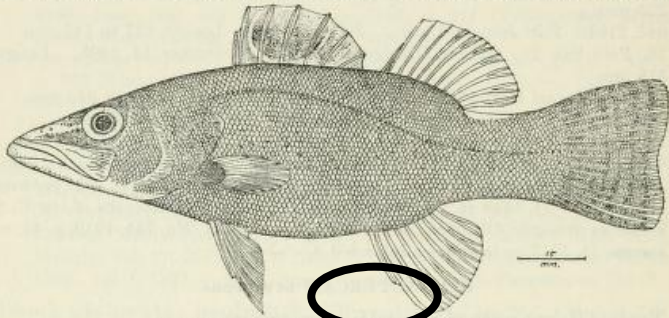


FIGURE 4.—BELONOPERCA CHABANAUDI, NEW SPECIES.

Reference

Any static document source (Publication; Specimen Determination Label; Field Notes, Correspondence, etc.).

Taxon Name Usage (TNU)

A usage of a taxon name within the context of a Reference.

Protonym (≈Basionym)

A usage of a taxon name representing the Code-Compliant “creation” of a new name.

tnuID	Reference	NameString	Rank	ProtonymID	ValidUsageID	ParentUsageID
123	Fowler & Bean, 1930:181	Belonoperca	Genus	123	123	
234	Fowler & Bean, 1930:182	chabanaudi	Species	234	234	123

Belonoperca pylei, a new species of seabass (Teleostei: Serranidae: Epinephelinae: Diploprionini) from the Cook Islands with comments on relationships among diploprionins

Carole C. Baldwin^{1*} & W. Leo Smith^{1,2}

¹Division of Fishes, MRC 159, National Museum of Natural History, Smithsonian Institution, Washington, D.C., 20560 USA (*e-mail: baldwinc@nmnh.si.edu)

²Present address: Department of Biology, Villanova University, Villanova, PA, 19085

(Received 13 December 1997; in revised form 11 April 1998; accepted 16 April 1998)

Ichthyological Research

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Baldwin, C. C. and W. L. Smith. 1998. *Belonoperca pylei*, a new species of seabass (Teleostei: Serranidae: Epinephelinae: Diploprionini) from the Cook Islands with comments on relationships among diploprionins. Ichthyol. Res., 45 (4): 325–339.

Abstract *Belonoperca pylei* is described from five specimens collected at depths of 68–122 m from Rarotonga, Cook Islands. It differs from all other known diploprionin serranids in having IX, 10 dorsal-fin rays, III, 7 anal-fin rays, and a color pattern composed primarily of yellow and orange pigments. Cladistic analysis of epinepheline morphology supports monophyly of the diploprionin genera *Belonoperca* and *Diploprion* and suggests that *Belonoperca* is the sister group of *Diploprion* plus the monotypic *Aulacocephalus*.

Key words. — Serranidae; *Belonoperca*; Cook Islands; phylogeny; larval morphology.

tnulD	Reference	NameString	Rank	ProtonymID	ValidUsageID	ParentUsageID
123	Fowler & Bean, 1930:181	Belonoperca	Genus	123	123	
234	Fowler & Bean, 1930:182	chabanaudi	Species	234	234	123
345	Baldwin & Smith, 1998	pylei	Species	345	345	456
456	Baldwin & Smith, 1998:325	Belonoperca	Genus	123	456	567
567	Baldwin & Smith, 1998:325	Diploprionini	Tribe	876	567	678
678	Baldwin & Smith, 1998:325	Epinephelinae	Subfamily	765	678	789
789	Baldwin & Smith, 1998:325	Serranidae	Family	654	789	987
987	Baldwin & Smith, 1998:325	Teleostei	Order			
...			

**Gee, Rich...
that's AWESOME!**

(But how does it help me?)

A Global Names Architecture

“*Pomatomus saltator* Linn.”

BPBBI 36339 OMAN93A - 003 Oman; John E. Randall; 5-9 Feb 93.

Catalog: I - Pisces Limit Loc: Types: Warnings

Cataloged Uncataloged Collection: Show Only Selected Records:

O/C: Locality: Southern Oman Specific: Rahah Bay; W side; rocky point; tidepools Habitat:

Acc: Accuracy: Salinity: M Depth: 0 - 1.5 m Gear: Rotenone

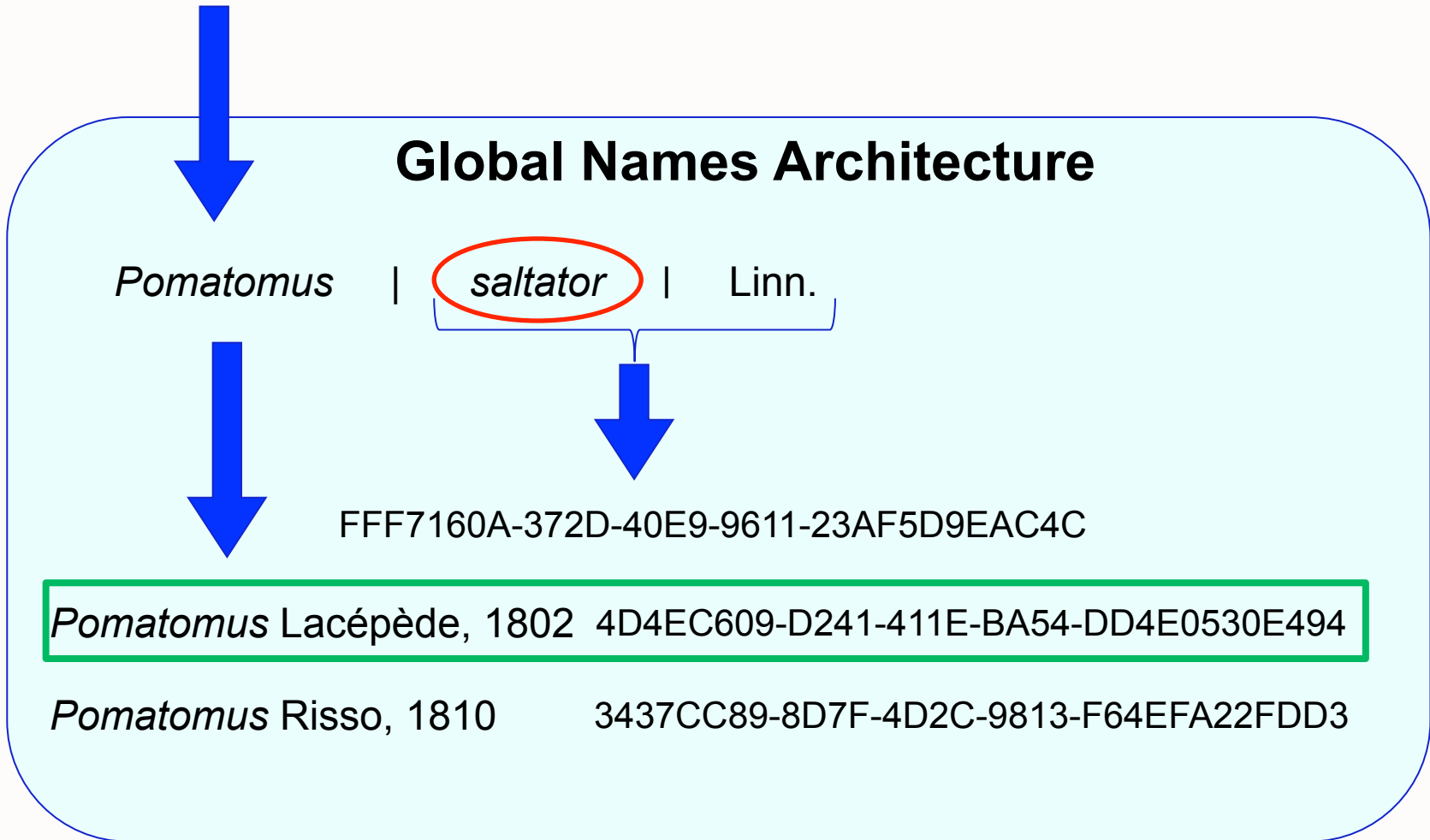
Collector(s): J.E. Randall and Ian McLeish Expedition: Vessel:

Date: 6 February 1993 Date: Comments:

Pref	BPBM	Sel	Confir	Genus:	Species:	Subspecies:	ID?	Type Status	Field#	#A	#D	Min	Max	Size Typ	Photo Type:	Photo'd Size:	Part
I	36338	<input type="checkbox"/>	Yes	Stethojulis	interrupta	-	No			3		25	51	SL			
I	36339	<input type="checkbox"/>	Yes	Gymnothorax	pseudothyrsoides	-	Yes			2		336	492	TL	Color	larger; 502 mm	Originally 2: 34
I	36340	<input type="checkbox"/>	Yes	Siderea	grisea	-	No			4		98	152	TL			
I	36341	<input type="checkbox"/>	Yes	Pempheris	nesogallica	-	No			1		120		SL	Color	153 mm TL	Originally 2: 11
I	36342	<input type="checkbox"/>	Yes	Pomacentrus	caeruleus	-	Yes			1		40		SL			
I	36343	<input type="checkbox"/>	Yes	Pseudochromis	-	-	No			1		36		SL	Color	44 mm TL	
I	36344	<input type="checkbox"/>	Yes	Scorpaenodes	littoralis	-	No			1		33		SL			
I	36345	<input type="checkbox"/>	Yes	Canthigaster	solandri	-	No			3		38	43	SL			
I	36346	<input type="checkbox"/>	Yes	Helcogramma	-	-	No			17		14	33	SL	Color	2: 28-30 mm SL	Originally recor
I	36347	<input type="checkbox"/>	Yes	Sardinella	-	-	No			6		165	169	SL	Color	168 mm SL; 20'	
I	36348	<input type="checkbox"/>	Yes	Pomadasys	-	-	No			1		180		SL	Color	220 mm TL	
I	36349	<input type="checkbox"/>	Yes	Mugilidae	-	-	No			2		152	156	SL	Color	larger; 197 mm	
I	36350	<input type="checkbox"/>	Yes	Pomatomus	saltator Linn.	-	No			2		225	226	SL	Color	larger; 285 mm	
I	36351	<input type="checkbox"/>	Yes	Otolithes	ruber	-	No			1		360		SL	Color	430 mm TL	
I	36352	<input type="checkbox"/>	Yes	Umbrina	-	-	No			1		445		SL	Color	530 mm TL	Blue Pod D -- LF
I	36353	<input type="checkbox"/>	Yes	Scomber	australasicus	-	No			2		210	222	FL	Color	larger; 244 mm	Originally 2: 21
I	36354	<input type="checkbox"/>	Yes	Epinephelus	retouti	-	Yes			1		340		SL	Color	430 mm TL	Blue Pod D -- LF
I	36355	<input type="checkbox"/>	Yes	Argyrops	spinifer	-	No			1		188		SL	Color	245 mm TL	
I	36356	<input type="checkbox"/>	Yes	Trichiurus	lepturus	-	No			1		705		TL	Color		Date of purchas
I	36357	<input type="checkbox"/>	Yes	Paraplagusia	blochii	-	No			2		211	220	TL	Color	smaller specime	First record fro
I	36358	<input type="checkbox"/>	No	Rhinobatos	salalah	-	No			1		552		TL			Originally 552 T
I	36359	<input type="checkbox"/>	Yes	Lagocephalus	-	-	No			1		220		SL	Color	260 mm TL	Loaned to Keich
I	36360	<input type="checkbox"/>	Yes	Siderea	-	-	No			1		174		TL			

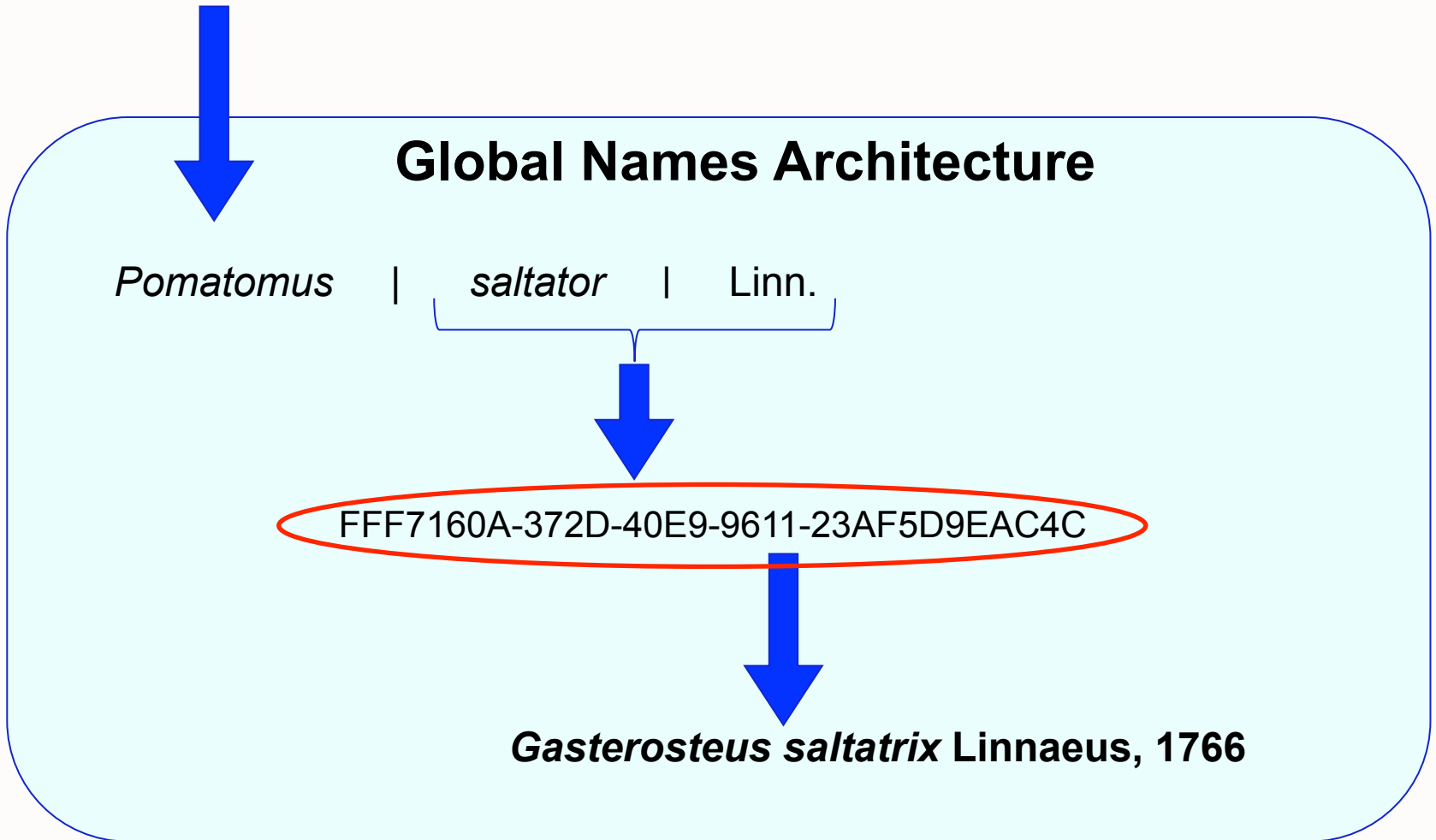
A Global Names Architecture

"*Pomatomus saltator* Linn."



A Global Names Architecture

"*Pomatomus saltator* Linn."



Homotypic Synonyms

	Genus Protonym UUID	Species Protonym UUID	Refs.
Gasterosteus saltatrix Linnaeus, 1766	97CE20CD-4D6E-4A59-8266-CD161B5521FB	FFF7160A-372D-40E9-9611-23AF5D9EAC4C	1
Gasterosteus Sallatrix Linnaeus, 1766	97CE20CD-4D6E-4A59-8266-CD161B5521FB	FFF7160A-372D-40E9-9611-23AF5D9EAC4C	1
Pomatomus saltator (Linnaeus, 1766)	4D4EC609-D241-411E-BA54-DD4E0530E494	FFF7160A-372D-40E9-9611-23AF5D9EAC4C	16
Pomatomus saltatrix (Linnaeus, 1766)	4D4EC609-D241-411E-BA54-DD4E0530E494	FFF7160A-372D-40E9-9611-23AF5D9EAC4C	35

Heterotypic Synonyms

Lopharis mediterraneus Rafinesque, 1810	A3BE1320-806C-4585-B5FE-5CAB2FB5DDF9	8C7E3E5A-3B36-4D23-AA0A-035F726DFBCD	1
Pomatomus mediterraneus (Rafinesque, 1810)	4D4EC609-D241-411E-BA54-DD4E0530E494	8C7E3E5A-3B36-4D23-AA0A-035F726DFBCD	1
Pomatomus pallasii (Eichwald, 1831)	4D4EC609-D241-411E-BA54-DD4E0530E494	969F0B46-2FD1-42BC-A5C9-22D2410076B3	1
Sypterus pallasii Eichwald, 1831	288B17D4-3133-4893-8998-74FD115DBB31	969F0B46-2FD1-42BC-A5C9-22D2410076B3	1
Pomatomus conidens (Castelnau, 1861)	4D4EC609-D241-411E-BA54-DD4E0530E494	64873DE7-934E-4603-8815-2EA90B66482B	1
Temnodon tubulus Saville-Kent, 1893	67D18558-763F-48B2-8F5A-44DBCF827931	25DE7CC4-E19F-4ADB-A590-582951E60AB1	1
Pomatomus nalnal (Rochebrune, 1880)	4D4EC609-D241-411E-BA54-DD4E0530E494	C33CA532-4060-4710-9533-7756F66B86C7	1
Sparactodon nalnal Rochebrune, 1880	921EE8B0-5C5C-45EB-BCDB-CD2AA724229D	C33CA532-4060-4710-9533-7756F66B86C7	1
Pomatomus pedica Whitley, 1931	4D4EC609-D241-411E-BA54-DD4E0530E494	86ADEBD2-8F52-492E-9792-946B1CCFBFA8	2
Perca lophar Forsskål, 1775	85AA15EB-BF9B-44D6-9DF2-4BE36017768C	00AB9C96-5FCA-4358-98E4-A186D8DE5490	1
Pomatomus lophar (Forsskål, 1775)	4D4EC609-D241-411E-BA54-DD4E0530E494	00AB9C96-5FCA-4358-98E4-A186D8DE5490	1
Cheilodipterus heptacanthus Lacépède, 1801	FBDC898C-F1EA-4768-85B0-521417959096	F848129B-E72A-4C84-918B-B98BEA1FF7AC	1
Pomatomus heptacanthus (Lacépède, 1801)	4D4EC609-D241-411E-BA54-DD4E0530E494	F848129B-E72A-4C84-918B-B98BEA1FF7AC	1
Pomatomus skib Lacépède, 1802	4D4EC609-D241-411E-BA54-DD4E0530E494	EC88117C-C83F-4088-8347-BF9C0491D874	2
Pomatomus sypterus (Pallas, 1814)	4D4EC609-D241-411E-BA54-DD4E0530E494	7CFC2F1F-1B81-4F03-9B31-E4CC81E20185	1
Scomber sypterus Pallas, 1814	86791AEA-32C5-4492-96B8-8273AB440742	7CFC2F1F-1B81-4F03-9B31-E4CC81E20185	1
Chromis epicurorum Gronow in Gray, 1854	EBF02DF4-0D67-4865-AFA1-A71FCB56BBBA	4A4BFEA-EACC5-4E12-98E1-F89B37896193	1
Pomatomus epicurorum (Gronow in Gray, 1854)	4D4EC609-D241-411E-BA54-DD4E0530E494	4A4BFEA-EACC5-4E12-98E1-F89B37896193	1
Anthias lophar Suckow, 1799	4E43AEB3-D6EB-478A-9039-46F8370C4F93	E28B3C39-6412-4F30-BED1-FFA67225EDC8	1
Pomatomus lophar (Suckow, 1799)	4D4EC609-D241-411E-BA54-DD4E0530E494	E28B3C39-6412-4F30-BED1-FFA67225EDC8	1

79 Taxon Name Usages

ZooBank

logged in as Richard Lawrence Pyle | register content | about | contact | api | log out | help

 Search

Gasterosteus saltatrix Linnaeus, 1766

LSID urn:lsid:zoobank.org:act:FFF7160A-372D-40E9-9611-23AF5D9EAC4C



Rank: Species

Parent: [Gasterosteus Linnaeus, 1758](#)

Specific Name: saltatrix

Authorship: Linnaeus

Publication: [Linnaeus, Carolus. 1766 Systema naturae sive regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Laurentii Salvii, Holmiae \[= Stockholm\]. Vol. **Tomus I**, No. 1, *Editio duodecima, reformata* Edition: 1-532.](#)

Page: 491

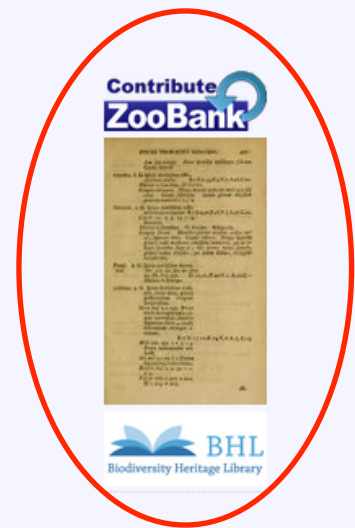
Figure(s):

Type Specimen(s): Syntypes: LS 116 (left head), 135 (left half-skin)

Type Locality: Carolina [South Carolina] and Virginia, U.S.A

Fossil: No

Edit | [add external identifier](#)



15 Related Names

Additional names information provided courtesy of the [Global Names Index](#).

dam subcarinata. Pinna dorsalis analisque falcata.
Cauda bifurca.

canadus. 6. G. spinis dorsalibus octo,
analibus nullis. B.7.D.8,33.P.2.V.7.A.26.C.20.

Habitat in Carolina. D. Garden.

Corpus oblongum. Pinna dorsalis posterior analisque falcata. Cauda subbiloba. Spinæ pinnam dorsalem præcedentem præcedentes 7. f. 8.

Saltatrix. 7. G. spinis dorsalibus octo
membrana connexis. B.7.D.8,26.P.16.V.1/2.A.27.C.21.

Catesb. car. 2. p. 14. t. 14.

Saltatrix.

Habitat in Carolina. D. Garden. Schipjach.

Corpus Perceæ. Maxilla inferior dentium ordine unico; superior binis. Cauda bifurca. Pinnæ dorsalis prioris radii membrana tenuissima intertexti, qui in reliquis speciebus separati; hæc species minus spinosa, præter radios dorsales, qui itidem debiles, in fossula recondendos.

Pungitius. 8. G. spinis dorsalibus decem.

Art. gen. 52. syn. 80. spec.

97. Fn. spec. 337. D. 10, 11. P. 10. V. 1. A. 11. C. --

Habitat in Europa.

volitans. 9. G. spinis dorsalibus tredecim, cirris senis, pinnis pectoralibus corpore longioribus.

Gron. mus. 2. n. 191. Perca dorso monopterygio, capite cavernoso, maxilla superiore cirris 4, cauda subrotunda utrinque aculeata.

B. 7. D. 13-12. P. 14. V. 6. A. 1/5, C. 13.

Will. icht. app. 1. t. 2. n. 3.
Perca amboinensis Niehoffi.

Seb. mus. 3. t. 28. f. 1. Cortus squamosus, rostro bifido.

Ruyssch. thes. 1. p. 39. t. 2.
f. 3.

Valent. amb. t. 210. n. 210.

Et t. 213. n. 213.

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 Search

Gasterosteus saltatrix Linnaeus, 1766

LSID urn:lsid:zoobank.org:act:FFF7160A-372D-40E9-9611-23AF5D9EAC4C



Rank: Species

Parent: [Gasterosteus Linnaeus, 1758](#)

Specific Name: saltatrix

Authorship: Linnaeus

Publication: [Linnaeus, Carolus. 1766 Systema naturae sive regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Laurentii Salvii, Holmiae \[= Stockholm\]. Vol. **Tomus I**, No. 1, *Editio duodecima, reformata* Edition: 1-532.](#)

Page: 491

Figure(s):

Type Specimen(s): Syntypes: LS 116 (left head), 135 (left half-skin)

Type Locality: Carolina [South Carolina] and Virginia, U.S.A

Fossil: No



Edit

[add external identifier](#)

15 Related Names



Additional names information provided courtesy of the [Global Names Index](#).

ZooBank.org x

zoobank.org/FFF7160A-372D-40E9-9611-23AF5D9EAC4C

Edit add external identifier

15 Related Names

 Additional names information provided courtesy of the [Global Names Index](#).

Canonical Name	Full Name	Accepted Name	Source
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus, 1766	Pomatomus saltatrix (Linnaeus, 1766)	Catalogue of Life
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus, 1766	Pomatomus saltatrix (Linnaeus, 1766)	Interim Register of Marine and Nonmarine Genera
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus, 1766	Pomatomus saltatrix (Linnaeus, 1766)	WoRMS
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus, 1766	Pomatomus saltatrix (Linnaeus, 1766)	GBIF Taxonomic Backbone
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus, 1766		EOL
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus, 1766		FishBase
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus, 1766		EUNIS
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus, 1766		BioLib.cz
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus, 1766		uBio NameBank
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus 1766		Catalog of Fishes
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus 1766 sec. Eschmeyer 2004		Bishop Museum
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus 1766		Bishop Museum
Gasterosteus saltatrix	Gasterosteus saltatrix Linnaeus 1766		Index to Organism Names
Gasterosteus saltatrix	Gasterosteus saltatrix		EOL
Gasterosteus saltatrix	Gasterosteus saltatrix		uBio NameBank

Asterosaurus sa..., 1766
URN:lsid:zoobank.org:act:FFF7160A-372D-40E9-9611-23AF5D9EAC4C

Rank: Species
Parent: *Gaster...*
Species Name: *atrix*
Authorship: *Linnaeus, Carolus*
Figure(s):
Type Specimen(s): Syntypes: LS 116 (left head), 135 (left half-skin)
Type Locality: Carolina [South Carolina] and Virginia, U.S.A
Fossil: No

Linnaeus, Carolus. 1766 Systema naturae sive regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Laurentii Salvii, Holmiae [= Stockholm]. Vol. **Tomus I**, No. 1, *Editio duodecima, reformata* Edition: 1-532.

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15 Related Names

gnl Additional names information provided courtesy of the Global Names Index.

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California Academy of Sciences

AnimalBase

Amphibian Species of the World

Linnaeus, C. 1758. Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis.

LSID [url:lsid:zoobank.org:pub:2C6327E1-5560-4DB4-B9CA-76A0FA03D975](https://zoobank.org/pub:2C6327E1-5560-4DB4-B9CA-76A0FA03D975)



IPNI

BHL

Hymenoptera Online

FishBase

Book: Linnaeus, Carolus. 1758. Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Laurentii Salvii. Holmiae [= Stockholm]. Vol. Tomus I, Editio decima, reformata Edition: i-ii, 1-824.

Full title: Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis

[Linnaeus, Carolus](#)

Volume: Tomus I
Edition: Editio decima, reformata
Publisher: Laurentii Salvii
Place Published: Holmiae [= Stockholm]
ISBN:
Pages: i-ii, 1-824
Date Published: 01 January 1758
DOI:
Language:

Registered Nomenclatural Acts (4820)

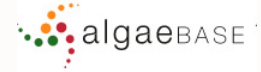
Genus Group

- [LSID](#) [Acarus Linnaeus, 1758](#)
- [LSID](#) [Acipenser Linnaeus, 1758](#)
- [LSID](#) [Alauda Linnaeus, 1758](#)

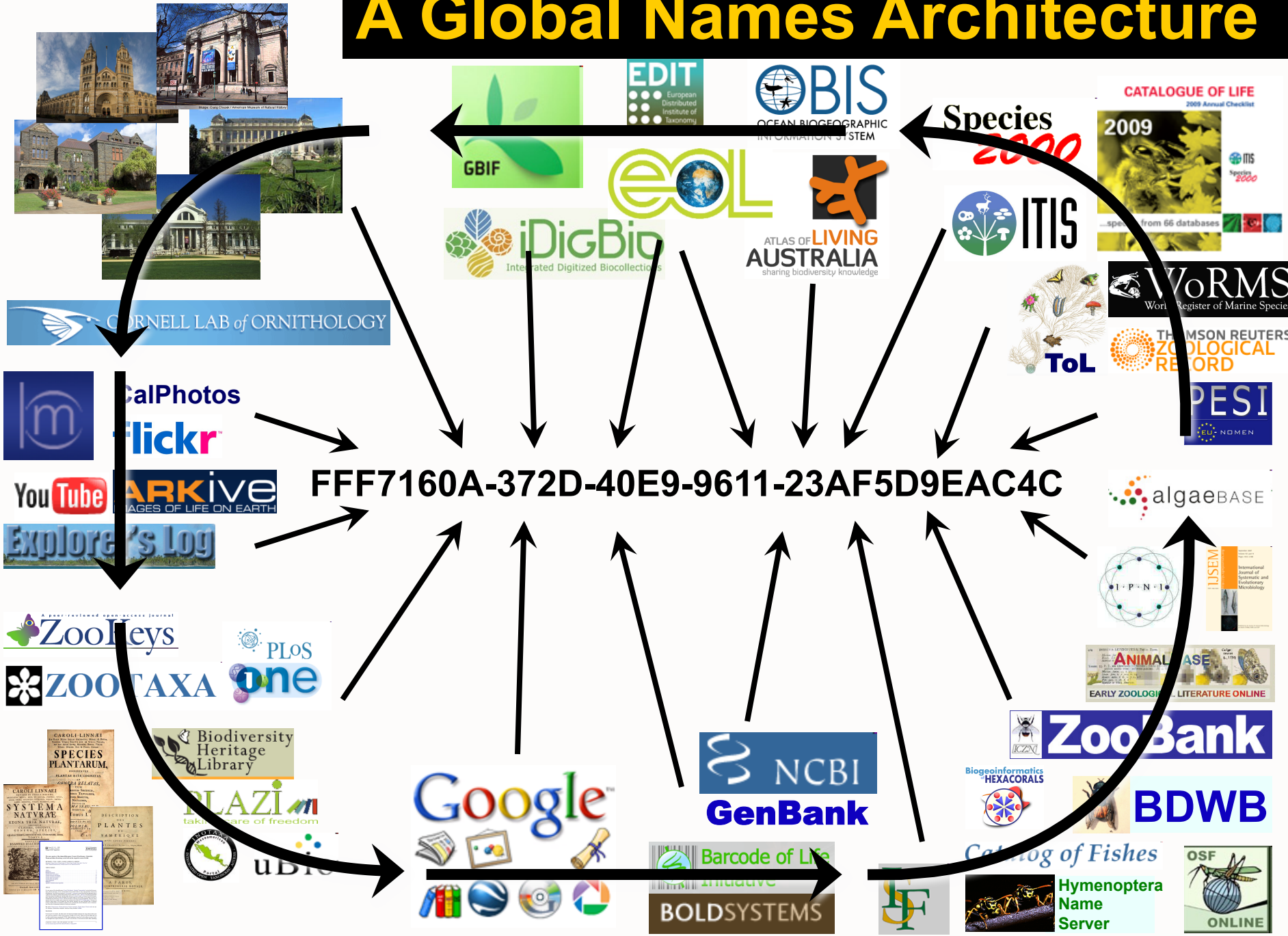
A Global Names Architecture



FFF7160A-372D-40E9-9611-23AF5D9EAC4C



A Global Names Architecture



**Gee, Rich...that's
SUPER AWESOME!**

(But seriously... how is it *really* going to help me?)

Query-Time Taxonomic Translation

(The Power of Meta-Authorities)


Taxon Name Usage (e.g., of Page et al. 2013:143)

“I assert that the species epithet “*saltator*” of Linnaeus 1766, is spelled as such, and is valid at the rank of species within the genus “*Pomatomus*” of Lacépède 1802.”

Meta-Authority Treatment (e.g., Catalog of Life)

“With regard to the epithet “*saltator*” of Linnaeus 1766, we follow the treatment of Page et al. 2013:143”

Query-Time Taxonomic Translation (The Power of Meta-Authorities)



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References

search...

Reference

Whitley, Gilbert P. 1931. New names for Australian fishes. *Australian Zoologist* 6(4): 310-334.

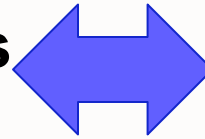
Author: Whitley, Gilbert P.
[checklist](#) | [parse spreadsheet](#) [CRS](#) [*](#) | [EndNote XML](#)

158 Total Names [38 Families 85 Genera]

Taxon	Parupeneus Bleeker, 1863 [as Caprupeneus Whitley, 1931] Follow		
Girellinae [as Girellidae] Follow	Pomatomus Lacépède, 1802 Follow		
Note Girella Gray in Grav, 1835 [as Girellipicis]	Pomatomus saltatrix (Linnaeus, 1766) [as Pomatomus pedica Whitley, 1931] Follow		
Note Girella Gray in Grav, 1835 [as Iredalella Whitley, 1931] Follow	Atractoscion Gill, 1862 [as Zeluco Whitley, 1931] Follow		
Note Kyphosus Lacépède, 1801 [as Segutulum]			
Note Kyphosus Lacépède, 1801 [as Segutulum]			
Note Kyphosus klunzingeri (Whitley, 1931) [as Segutulum klunzingeri Whitley, 1931] Follow			
Atypichthys Günther, 1862 Follow			
Note Atypichthys argatus (Günther, 1860) [as Atypichthys mado Whitley, 1931] Follow	zoobank	Species	312 New child taxon add svn.
Note Microcanthinae <i>INCERTAE SEDIS</i> [as kershawi Whitley, 1931] [as Vinculum kershawi Whitley, 1931] Follow	zoobank	Species	321 New child taxon add svn.
Note Tilodon Thominot in Thominot, 1891 [as Vinculum McCulloch, 1914] Follow	zoobank	Genus	New Species add svn.
Lutianidae Follow	zoobank	Family	New Genus add svn.
Note Aphareus Cuvier in Cuvier & Valenciennes, 1830 [as Humefordia Whitley, 1931] Follow	zoobank	Genus	334 New Species add svn.
Muraenidae Follow	zoobank	Family	New Genus add svn.
Note Parupeneus Bleeker, 1863 [as Barbusupeneus Whitley, 1931] Follow	zoobank	Genus	317 New Species add svn.
Note Parupeneus Bleeker, 1863 [as Caprupeneus Whitley, 1931] Follow	zoobank	Genus	317 New Species add svn.
Note Pomatomus Lacépède, 1802 Follow	zoobank	Genus	New Species add svn.
Note Pomatomus saltatrix (Linnaeus, 1766) [as Pomatomus pedica Whitley, 1931] Follow	zoobank	Species	316 New child taxon add svn.
Note Atractoscion Gill, 1862 [as Zeluco Whitley, 1931] Follow	zoobank	Genus	317 New Species add svn.
Sparidae Follow	zoobank	Family	New Genus add svn.
Note Sparus Linnaeus, 1758 [as Roughlevia Whitley, 1931] Follow	zoobank	Genus	318 New Species add svn.
Gobiesocinae [as Gobiesocidae] Follow	zoobank	Family	New Genus add svn.

Current Numbers

- 1,236 Contributors
- 70,404 Agents (Authors)
- 73,779 References
 - 8,547 Journals
 - 4,302 Books
 - 2,205 Book Sections
 - 51,205 Articles
 - 7,520 Other
- 523,700 Taxon Name Usages
 - 185,772 Protonyms



~2M Species
~5-10M Protonyms
~50M Name-Strings?
~100M's TNUs???

Scaling Content

Publication Workflow (Pensoft, Zootaxa, Others)

Bulk Import

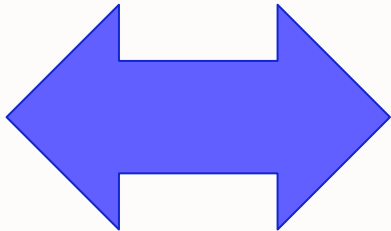
- Sherborn's *Index Animalium* (7,700+ References, 430K TNUs)
- Hymenoptera Name Server
- Systema Dipterorum (35K References, 130K TNUs)
- Dozen+ other nomenclator databases
- BHL (3,400 Journals, 55K Books, 100'sK Articles)



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BHL References cross-linked to GNUB are combined with Protonyms from the GNI name discovery process to generate TNUs.



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