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KEYS TO THE FRESHWATER FISHES OF THE MARITIMES.

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Author

H. W. Smith.

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The following keys to the families, genera and species of fish apply only to the Maritime provinces. In certain families only one species is known to occur and thus in certain cases the key to the families is all that need be used. It is not to be inferred that these are the only members of these several families, for frequently there are many species belonging to each family and which occur in other parts of North America and elsewhere.

Certain of the species indicated in the keys are quite rare in the Maritimes, or may not occur at all, but, since they have been listed for neighbouring Maine and Quebec, they are included. This applies particularly to some of the cyprinids. On the other hand, species omitted from these keys may in the future be found in the Maritime provinces. Thus when new records are made the keys will have to be modified to include these additional species.

KEY TO FAMILIES OF FRESHWATER FISHES OF THE MARITIME PROVINCES.

A	Mouth a sucking disc.-----	Petromyxonidae
A	Mouth a gape bordered by upper and lower jaws -----	Al
Al	Caudal fin typically heterocercal. Body partially plated. Snout conical. -----	Acipenseridae
Al	Caudal fin nearly or quite homocercal. Body usually scaled. (Bony fishes) -----	B
B	Dorsal fin with no spinous rays, or with only one. Pelvic fin without spine. -----	C
B	Dorsal fin with more than one spine. Pelvic fins with spine. ----	L
C	Pectoral fins inserted ventrally and laterally (except in eel). -	D
C	Pectoral fins inserted laterally and vertically *****-----	Cyprinodontidae
D	Body not eel-shaped. Pelvic fins developed -----	E
D	Body eel-shaped. Pelvic fins wanting -----	Anguillidae
E	Chin without barbels. Pectoral fin without spine. Body scaled -----	F
E	Chin with barbels. Pectoral fin with strong spine. Body scaleless -----	Ameiuridae
F	Front of head not shaped like a duck's bill *****-----	G
F	Front of head shaped like a duck's bill -----	Esocidae
G	Gill membranes free from isthmus. -----	H
G	Gill membranes united to isthmus. -----	K
H	No adipose fin developed -----	Clupeidae
H	Adipose fin developed -----	I
I	Scales small, more than 100 in lateral line. -----	Salmonidae
I	Scales larger, fewer than 100 in lateral line -----	J
J	Teeth strong -----	Osmeridae
J	Teeth very weak or absent -----	Coregonidae
K	Mouth fitted for sucking. Lips more or less thick -----	Catostomidae
K	Mouth not fitted for sucking. Lips thin -----	Cyprinidae

- L No barbel at tip of lower jaw ----- M
L Barbel at tip of lower jaw. ----- Gadidae
- M Dorsal spines connected by membrane. No bony plate behind pelvic fins --- N1
M Dorsal spines isolated. Bony plate behind pelvic fins ----- Gasterosteidae
- N1 Body covered with ordinary scales. Pelvic fin with 5 soft
(articulated) rays ----- N
N1 Body scaleless, or with a few prickles only. Pelvic fins with only 3 or
4 soft rays ----- Cottidae
- N Dorsal fins, two, entirely separated or slightly joined together. Anal
spines three or less ----- O
N Dorsal fin single. Anal spines three or more (except rarely in
Micropterus). ----- Centrarchidae
- O Anal spines three ----- Moronidae
O Anal spines one or two ----- Percidae

KEY TO GENERA AND SPECIES OF FRESHWATER FISHES OF MARITIME PROVINCES.

- Family PETROMYZONIDAE -- 1 species -- Petromyzon marinus (lamprey)
- Family ACERPENSERIDAE -- 1 species -- Acipenser oxyrhynchus (sturgeon)
- Family CYPRINODONTIDAE -- 1 species -- Fundulus diaphanus (killfish)
- Family ANGUILLIDAE -- 1 species -- Anguilla rostrata (eel)
- Family AMEIURIDAE -- 1 species -- Ameiurus nebulosus (bullhead or catfish)
- Family ESOCIDAE -- 1 species -- Esox niger (pickerel)
- Family CLUPEIDAE -- 2 species --

Premaxillaries meeting at a broad angle so that tip of jaw appears not knotted. Lower jaw more or less projecting. Cheeks longer than deep. No wing-like scales at base of caudal fin -----Pomolobus pseudoharengus (alewife)

Premaxillaries meeting in front at a very acute angle, the knotted tip of the upper jaw receiving the mandible. Cheeks deeper than long. No teeth. A pair of wing-like scales at base of caudal fin -----Alosa sapidissima (shad)

Family SALMONIDAE -- 5 species --

- A Vomer flat, its toothed surface plane. Species black spotted, with conspicuous scales ----Genus Salmo
- A Vomer boat-shaped, the shaft strongly depressed without teeth. Scales very small, 200 or more in lateral line. Species with pale spots ----- B
- B Vomer with raised crest, extending backward from the head, parallel with shaft; this crest armed with strong teeth. Spots gray, never red -----Genus Cristivomer - 1 species -- Cristivomer namaycush (lake trout or togue)
- B Vomer without raised crest, only its head toothed. Red-spotted, the lower fins with bright edgings - Genus Salve - linus -- 1 species -- Salvelinus fontinalis (brook trout)

Genus Salmo -- 3 species --

- a Vomerine teeth little developed, those on shaft few and often deciduous. Scales large, about 120 in lateral line. Breeding males with strongly hooked jaw -- Salmo salar (Atlantic salmon)
-- Salmo salar sebago (landlocked)
- a Vomerine teeth numerous, persistent in long double, zigzag row. Scales moderate or small, 115 to 200 in lateral line. Sexual differences less marked

- b Ocellated red spots more or less well developed. Pectoral fins large. Adipose more or less orange with faint spots or none. Scales 115 to 150 in lateral line -- Salmo fario (brown trout)
- b Body more conspicuously spotted with black but without red spots. Adipose definitely spotted or margined with black -----Salmo gairdneri (rainbow)

Family OSMERIDAE -- 1 species -- Osmerus mordax (smelt)

Family COREGONIDAE -- 1 species -- Prosopium quadrilaterale (round whitefish)

Family CATOSTOMIDAE -- 2 species --

A Scales very small, much reduced and crowded anteriorly, about 100 in lateral line. Lips flatly expanded; median fissure of lower lip clearly visible with mouth at repose -- Catostomus catostomus (northern sucker)

A Scales larger, but crowded forward. About 70 in lateral line. Lips rather constricted; median fissure of lower lip scarcely apparent when mouth is in repose -- Catostomus commersonii (common sucker)

Family CYPRINIDAE -- 10 species --

A Dorsal fin with first ray slender and bony and closely attached to second ray -----B

A Dorsal fin with first ray enlarged, covered with thick skin and separated from second ray by a well-defined membrane -- Pimephales promelas (fat-head minnow)

B Intestine short, with single main loop, less than twice as long as body. Peritoneum typically pale -- C

B Intestine elongate, with more than one main loop, and more than twice as long as body. Peritoneum black -- Chrosomus erythrogaster (red-bellied dace)

C Abdomen behind pelvic fins rounded over and fully scaled ----- D

C Abdomen behind pelvic fins with a fleshy keel over which scales do not pass. Body sharply compressed. Lateral line much decurved ----- Notemigonus crysoleucas (golden shiner)

D Maxillary with barbel ----- E

D Maxillary without barbel ----- Genus Notropis

E Barbel on maxillary terminal -----F

E Barbel on lower edge of maxillary well in advance of its tip ----- G

- F Premaxillaries protractile. Dorsal fin inserted little or not at all behind the middle of total length, exclusive of tail. Upper jaw strictly terminal. Mouth oblique, rising to the horizontal of eye anteriorly.---- Couesius plumbeus (lake chub)
- F Preaxillaries non-protractile, bound to the forehead by a broad fenum. Dorsal fin inserted well behind middle of total length, exclusive of tail --
Genus Rhinichthys
- G Origin of dorsal fin over pelvic base. Scales large, little silvery. No black spot on dorsal fin ---
Leucosomus corporalis (fallfish)
- G Origin of dorsal fin just behind pelvic fin. Scales smaller, scarcely silvery. Black spot on dorsal fin -- Semotilus atromaculatus (horned dace)

Genus Rhinichthys -- 2 species

- a Snout long and prominent, projecting notably beyond the mouth, about twice length of eye in adult. Barbel evident -- Rhinichthys cataractae.
(long-nosed dace)
- a Snout moderate, projecting little beyond the small mouth, its length $1\frac{1}{2}$ times eye in adult. Barbel minute or sometimes obsolete. A black or brown lateral band, bordered above and below by pale coloration -- Rhinichthys atromasus
(black-nosed dace)

Genus Notropis -- 2 species

- a Anal fin base short, the principal rays usually 8. A definite black spot at base of caudal fin. Lateral line slightly decurved. -- Notropis hudsonius.
- a Anal base longer, principal rays 8-10, usually 9. Lateral line decurved. No spot at base of caudal fin ----- Notropis cornutus
(common shiner)

Family GADIDAE -- 1 species -- Lota macolosa (burbot, ling)

Family GASTEROSTEIDAE -- 3 species.

- A Dorsal spines 7 to 11, body slender, mostly naked. Tail keeled. -- Pungitius pungitius (nine-spined stickleback)
- A Dorsal spines 5, body stoutish, naked. Tail not keeled -- Eucalia inconstans (brook stickleback)
- A Dorsal spines 3 or 4, strong, divergent. Body robust. Usually mailed -- Gasterosteus aculeatus (common stickleback)

Family CENTRARCHIDAE -- 2 species

- A Body elongate, bass-shaped, depth about one-third length. Anal spines very small, the longest less than half as high as longest soft ray; the last spine bound rather tightly to the soft rays. --
Micropterus dolomieu (small-mouthed black bass)
- A Body chubbier, sunfish-shaped, depth ordinarily about half the length. Anal spines larger and stronger, the longest more than half as high as soft fin, the last spine well separated by membrane from first soft ray -- Eupomotis gibbosus (sunfish)

Family COTTIDAE -- 1 species -- Cottus (cognatus?) (miller's thumb)

Family MORONIDAE -- 1 species -- Morone americana (white perch)

Family PERCIDAE -- 1 species -- Perca flavescens (yellow perch)

GLOSSARY OF TERMS USED IN KEYS

- Adipose fin -- A fleshy, fin-like projection behind the dorsal fin.
- Anal fin -- The fin on the median line behind vent.
- Barbel -- An elongated fleshy projection usually about the head. Those used in keying the cyprinids and located on maxillary may be quite minute, requiring a magnifying glass in some cases to detect.
- Caudal fin -- The tail fin.
- Cheek -- The space below the eyes.
- Chin -- The space between the bones of the lower jaw.
- Dorsal fin -- The fins on the back.
- Frenum -- The membranous fold which attaches the premaxillary to the maxillary in Rhinichthys and which restricts the motion of the premaxillary.
- Isthmus -- The space between the gill clefts.
- Lateral line -- A series of small tubes forming a raised line along the sides of a fish.
- Mandible -- Under jaw.
- Maxillaries -- Outermost and hindmost bones of the upper jaw and joined to the premaxillaries in front. Usually extending farther back than the premaxillaries.
- Pectoral fin -- The anterior or uppermost of the paired fins.
- Peritoneum -- The membrane lining the abdominal cavity.
- Premaxillaries -- The bones, one on either side, forming the front of the upper jaw.
- Spine -- A modified fin ray, unbranched, and usually more or less stiff.
- Vomer -- The front part of the roof of the mouth; a bone lying immediately behind the premaxillaries.
- Vomerine teeth -- Teeth situated on the vomer.