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SOME CHINESE FRESH-WATER FISHES¹

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IV.—GUDGEONS OF THE GENUS *CORIPAREIUS*

The genus *Coripareius* is based by Garman, 1912, on *Labeo cetopsis* Kner, 1867, from Shanghai. Some of Garman's material from the Yang-tze which he identified with *cetopsis* was probably referable to *Pseudogobio styani* Günther, 1889. We have no material referable to *cetopsis*, which apparently differs from *styani* in having the vent half-way between ventral and anal (from description), the dorsal origin equidistant from end of snout and front of anal (from figure).

This genus is characterized by a single pair of exceptionally long barbels, small eye a little before the center of the head, long compressed peduncle, rather small scales, and a single row of anvil-shaped teeth. Its distinguishing characters are perhaps less tangible than those of such specialized gudgeons as *Pseudogobio*, *Rhinogobio*, and *Saurogobio*; but the writer was of the impression, before finding that it had already been named by Garman, that it is actually less, rather than more, closely related to *Gobio* than are these. *Gobio uranoscopus caucasicus* as figured by Berg, 1916, is very suggestive of *Coripareius*. Recent collections of the Third Asiatic Expedition contain two species as follows.

Coripareius styani (Günther)

Pseudogobio styani GÜNTHER, 1889, Ann. and Mag. Nat. Hist., (6) IV, p. 224.

The following is a description of a specimen from Huping, Tungting Lake, Hunan, collected by C. H. Pope.

Length to base of caudal, 74 mm. Depth in length, 5; head, 4.1. Eye in head, 6; snout, 2.5; interorbital, 2.6; maxillary, 3.5; barbel, 2; width of body, 1.6; depth of peduncle, 2.2; its length, 1.2; pectoral, 1.1; ventral, 1.4; longest dorsal ray, 1; longest anal ray, 1.5; caudal lobe, 0.9; distance between gill-slits, 5.5.

Dorsal, 9; anal, 8. Scales, 56.

Little compressed before the dorsal, compressed behind it; lower surface of head flattish, the upper evenly convex; front of back narrow, breast broad and gently rounded; vent a short distance before anal origin. Snout bluntly pointed, extending

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a little beyond the small inferior horizontal curved mouth; lips rather thick and smooth; maxillary not nearly to eye; with a long cylindrical tapering roughened subterminal barbel; gill-membranes rather broadly joined to isthmus under edge of preopercle. Dorsal origin equidistant from tip of snout and middle of last anal ray; dorsal and anal without spinous rays; ventral under middle of dorsal; pectoral not quite reaching to ventral, ventral not nearly to anal; caudal well forked with pointed lobes; its rudimentary rays precurrent in a short low keel above and below. Scales with rather wide-spaced horizontal parallel striæ; lateral line complete, straight, in the center; an elongate pointed axillary ventral flap with 1 or 2 covert scales.

Color dull, uniform; the front and tip of the dorsal dusky.

Coripareius septentrionalis, new species

DESCRIPTION OF TYPE.—Number 8416, American Museum of Natural History, from Paotow, Mongolia, on the Yellow River a little west of the Shansi boundary; collected by C. H. Pope.

Length to base of caudal 240 mm. Depth in length, 4.5; head, 4.8. Eye in head, 8.6; snout, 2.8; interorbital, 3; maxillary, 3; barbel, 1.8; distance between gill-clefts, 8.6; greatest width (at shoulder), 1.4; depth of peduncle, 2; its length, 1; pectoral, 1; ventral, 1.4; longest dorsal ray, 1.1; longest anal ray, 1.4; upper caudal lobe, 0.9.

Dorsal, 9; anal, 8. Scales, 55 (last three on caudal base).

Somewhat compressed; snout and anterior part of head depressed; the head narrowing forward; front of back elevated; breast broad; vent five times as far from ventral axil as from anal origin. Mouth inferior, transverse, horizontal, horseshoe-shaped; the bluntly pointed snout extending a little beyond it; lower jaw squarely truncate at the end; with free lip only at the side, the same confluent with maxillary and lip of upper jaw; lips and chin granular with non-prominent papillæ; maxillary not nearly to below eye; a subterminal, long, tapering, thick-based barbel which reaches to slightly beyond edge of preopercle; interorbital flattish across the top, dropping at the sides to the small eye which is appreciably below the profile and almost strictly lateral; gill-membranes joined to isthmus before edge of preopercle. Dorsal and anal without spinous rays; dorsal origin equidistant from tip of snout and middle of anal base; pectoral not reaching ventral; ventral about half-way to anal; free edges of dorsal and anal concave; caudal forked, the upper lobe a little the longer. Body fully scaled; scales with conspicuous close-set parallel horizontal striæ; lateral line straight, in the center, complete; a bluntly pointed ventral axillary flap scaled on its base.

Color rather dark; the border of dorsal, margin of caudal and center of pectoral more or less blackish.

This species is close to *C. styani*, than which it probably reaches a larger size, and, if it were not for the narrower head and more anterior dorsal origin, might be taken for an overgrown example of *styani*.

V.—GUDGEONS RELATED TO THE EUROPEAN *GOBIO GOBIO*

Certain of the numerous tribe of Chinese gudgeons are closely related to the typical species, *Gobio gobio* of Europe. In fact, Fowler, 1924,

synonymizes a form from Chihli with it. In the writer's opinion this fish is slightly different, though very likely identical with *Gobio gobio soldatovi* Berg, 1914 and 1916. A small fish from Shansi, again, would seem to be subspecifically separable from it, and another with exceptionally long barbel from the same province represents a well-marked species. Descriptions of these three forms follow.

Gobio soldatovi Berg

Gobio gobio var. *soldatovi* BERG, 1914, 'Faune Russ.,' Poiss. III, part 2, p. 461, Fig. 63.

The following is a description of a specimen from Hsing-lung-shan, Eastern Tombs, Chihli, August 7, 1921; collected by C. H. Pope.

Length to base of caudal, 76 mm. Depth in length, 4.6; head, 3.4. Eye in head, 4; snout, 3; interorbital, 3.8; maxillary, 3.3; width of mouth, 3.8; barbel, 3.8; greatest width of body (the back of head), 2.2; depth of peduncle, 2.7; its length, 1.4; pectoral, 1.5; ventral, 1.8; longest dorsal ray, 1.5; longest anal ray, 2; caudal lobe, 1.2.

Dorsal, 9; anal, 8. Scales, 40.

Little compressed; snout bluntly pointed; vent at one-quarter the distance from anal origin to ventral axil. Eye very slightly superolateral; interorbital slightly concave; a slight groove across snout; mouth slightly oblique, inferior, horseshoe-shaped; maxillary not quite to under front of eye; with a well-developed subterminal barbel; lips moderately thick, not free across chin; gill-membranes joined to side of breast under edge of preopercle. Dorsal and anal without spinous rays; dorsal origin slightly nearer tip of snout than base of caudal; ventral origin beneath about the center of dorsal base; pectoral rounded, reaching three-quarters the distance to ventral; ventral not quite to anal; caudal moderately forked, the upper lobe the more pointed and slightly the longer (another specimen with lower lobe the longer). Scales with conspicuous close-set radiating striæ; scales absent from breast before pectoral axil; lateral line complete, in the center, rising a little to meet opercle.

Top of head dark; lower surfaces pale; a blackish longitudinal stripe, faint and ill-defined in front; also ill-defined dark longitudinal streaks on back and sides; a black blotch over upper pectoral axil; a faint blackish blotch in the stripe near end of peduncle; dorsal and caudal lightly barred; pectoral with a couple of faint bars.

Gobio soldatovi minusculus, new subspecies

DESCRIPTION OF THE TYPE.—Number 8417, American Museum of Natural History, from Kweihwa, Shansi; collected by C. H. Pope.

Length to base of caudal, 57 mm. Depth in length, 4.6; head, 3.5. Eye in head, 3.8; snout, 3; interorbital, 3.5; maxillary, 3.5; depth of peduncle, 3; length of peduncle, 1.4; pectoral, 1.3; ventral, 1.6; longest dorsal ray, 1.5; longest anal ray, 1.7; caudal lobe, 1. Barbel in eye, 1.3.

Dorsal, 9½; anal, 8. Scales, 41. Teeth (from a cotype), 5,2.

Slender, moderately, compressed, broadest at the back of the head; eye placed high, almost strictly lateral, very little superolateral; the interorbital slightly concave due to orbital rim being slightly raised; profile rounding downward before the eye, with a shallow dent in front of nostril; breast and belly flattish but not so much so that either pectorals or ventrals lie in a horizontal plane; vent a little nearer anal origin than to ventral axil. Mouth horizontal, slightly inferior, semicircular; with thick, slightly and finely papillose lips, grooves behind sides of lower lip not quite meeting at the chin; maxillary not quite to front of eye, with a well-developed sub-terminal barbel; gill-membranes adnate to breast under edge of preopercle. Dorsal and anal without spinuous rays; center of dorsal base equidistant from front of eye and base of caudal; ventral base under center of that of dorsal; pectoral and ventral rounded; pectoral not quite reaching ventral, ventral not quite reaching anal; caudal shallowly forked; rudimentary caudal rays precurrent as short low keels above and below on peduncle. Lateral line complete, dipping slightly in front, straight and in center from behind dorsal axil; breast scaleless.

About seven blotches along side with a tendency to be confluent; somewhat dark above, a dark stripe from eye toward snout; lower surfaces and lower fins pale; dorsal and caudal faintly barred.

Gobio coriparoides, new species

DESCRIPTION OF THE TYPE.—Number 8418, American Museum of Natural History, from the vicinity of Ningwu, Kolan and Tsinglo, Shansi; collected by C. H. Pope.

Length to base of caudal, 77 mm. Depth in length, 4.6; head, 3.5. Eye in head, 4.5; snout, 3; interorbital, 3; maxillary, 3.3; barbel, 2.3; width of mouth, 3.4; greatest width (the back of head), 1.8; depth of peduncle, 2.5; its length, 1.2; pectoral, 1.2; ventral, 1.5; longest dorsal ray, 1.2; longest anal ray, 1.4; lower caudal lobe, 1.

Dorsal, $9\frac{1}{2}$; anal, 8. Scales, 42. Teeth, 5, 2.

Moderately compressed; head below, breast and belly flattened; ventrals (and pectorals to a less extent) in a horizontal plane; vent at one-quarter the distance from anal origin to ventral axil. Interorbital flattish; mouth inferior, horizontal, horseshoe-shaped; lower jaw included; maxillary not quite to under front of eye, with a long terminal barbel; eye almost strictly lateral; gill-membranes joined to side of breast below edge of preopercle. Dorsal and anal without spinuous rays; dorsal origin equidistant from tip of snout and tip of depressed anal; ventral origin behind that of dorsal; pectoral passing ventral origin; ventral reaching to vent; anal falcate; caudal forked, the lower lobe the longer. Scales with conspicuous rather close-spaced radiating striæ; breast scaleless anterior to pectoral axil; lateral line complete, straight, in the center, rising a little to meet opercle at extreme front end.

Color rather dark, paler below; a faint dark longitudinal band on the peduncle.

From general appearance, the writer would be tempted to place this species in *Coripareius*, were its teeth not typical of *Gobio*.

There are two other somewhat aberrant, apparently undescribed species of the genus *Gobio*. One from Tungting suggests certain species of *Rhinogobio*; the other, from Shansi, has a form suggestive of *Sauro-*

gobio, color pattern of *Pseudogobio* but lips restricted, versus unusually developed as in these two specialized genera.

***Gobio longipinnis*, new species**

?*Rhinogobio ventralis* SAUVAGE AND DABRY DE THIERSANT, 1874, Ann. Sci. Nat., (6) I, Art. 5, p. 11.

DESCRIPTION OF THE TYPE.—Number 8419, American Museum of Natural History, from Huping, Tungting Lake, Hunan; collected by C. H. Pope.

Length to base of caudal, 95 mm. Depth in length, 4.7; head, 3.9. Eye in head, 7; snout, 2.1; interorbital, 3; maxillary, 2.4; width of mouth, 3.5; barbel, 7; greatest width of body (at back of head), 1.7; depth of peduncle, 2.2; its length, 1.4; pectoral, 1.1; ventral, 1.2; longest dorsal ray, 0.9; longest anal ray, 1.2; lower caudal lobe, 0.8; distance between gill-clefts, 3.

Dorsal, 10; anal, 9. Scales, 52. Teeth, 5, 2.

Moderately compressed; snout pointed; vent at three-eighths the distance from anal origin to ventral axil. Interorbital convex, striate with rows of small tough prominences; mouth at a distance behind tip of snout, one and one-half times eye, inferior, transverse, horizontal, forming a broad subtruncate curve; maxillary reaching a little short of front border of eye; with a terminal barbel; eye somewhat superolateral; gill-membranes broadly joined to side of breast behind edge of preopercle. Dorsal and anal without spinous rays; dorsal origin equidistant from tip of snout and tip of last anal ray; ventral origin slightly behind that of dorsal; pectoral passing ventral origin; ventral reaching to anal origin; anal three-fourths the distance to base of caudal; caudal well forked, lower lobe a little the longer. Scales with well-spaced horizontal striae; small scales present on breast to line between gill-clefts; lateral line complete, straight, in the center, rising a very little to meet opercle at its extreme front end.

Color uniform.

***Gobio rivuloides*, new species**

DESCRIPTION OF THE TYPE.—Number 8420, American Museum of Natural History, from Niang-tze-kwan, Shansi; collected by C. H. Pope.

Length to base of caudal, 133 mm. Depth in length, 5.5; head, 3.7. Eye in head, 6; snout, 2.3; interorbital, 3.8; maxillary, 2.6; width of mouth, 2.7; barbel, 2.6; width between gill-openings, 6; depth of peduncle, 2.8; its length, 1.4; pectoral, 1.3; ventral, 1.4; longest dorsal ray, 1.4; longest anal ray, 1.8; upper caudal lobe, 1.2.

Dorsal, 9½; anal, 9. Scales, 42. Teeth (from a cotype), 5, 3.

Head flat-topped; snout steep; body cylindrical; peduncle compressed; the back not elevated; belly flattish, ventrals in a horizontal plane; vent about equidistant from ventral axil and anal origin. Tip of snout soft, somewhat swollen, papillose; mouth inferior, semicircular, horizontal, with thick papillose lips produced backward at the corners and stopping at the sides of the lower jaw; maxillary not reaching eye; with a single well-developed subterminal barbel; eye superolateral; gill-membranes joined to the isthmus under edge of preopercle. Middle of dorsal base equidistant from nostril and base of caudal; the ventral origin slightly in advance thereof; pectoral reaching more than two-thirds the distance to ventral; ventral

more than three-quarters distance to anal; caudal forked, upper lobe the longer (in another specimen it is the shorter) and more pointed. Scales with rather close-spaced radiating striæ; breast naked, the scaleless area ending in a blunt point nearer isthmus than ventrals.

Color dark, paler along the belly, about ten vague squarish unequal blackish blotches along lateral line; two blackish stripes radiating from the lower border of the eye to the mouth; caudal crossed by rows of fine black spots; dorsal with a few such rows, and pectoral with two or three faint ones.

VI.—NEW GUDGEONS OF THE GENERA *GNATHOPOGON* AND *LEUCOGOBIO*

The recognition of *Gnathopogon* Bleeker, 1860, and *Leucogobio* Günther, 1896, genera of minnow-like and chublike gudgeons, as distinct from *Gobio*, is largely a matter of convenience. There seem to be several well-marked species of each in the Chinese fish-fauna. Recent authors sometimes synonymize these genera with *Gobio* (*Leucogobio chankaënsis* and *tæniatus*,—Berg, 1916; *Gobio* [*Gnathopogon*] *argentatus* and *wolterstorffi*,—Fowler, 1924) while recognizing *Paraleucogobio* Berg, 1907 (in the writers' opinion only subgenerically distinct from *Leucogobio*, in a single relative character of the last simple dorsal ray) as a full genus. Jordan, 1920, unites *Leucogobio* with *Gnathopogon*. They seem to be about equally different from one another and from *Gobio*, but the type of *Gnathopogon* (*Capoëta elongata*, Temminck and Schlegel, 1844) approaches *Leucogobio* more closely than do most of the species referable to *Gnathopogon*. *Squalidus chankaënsis* Dybowski, 1872, may be an aberrant species of *Leucogobio* as here understood, in which case *Leucogobio* becomes a synonym of *Squalidus* Dybowski.

Leucogobio polytænia, new species

DESCRIPTION OF THE TYPE.—Number 8421, American Museum of Natural History, from Niang-tze-kwan, Shansi; collected by C. H. Pope.

Length to base of caudal, 76 mm. Depth in length, 3.7; head, 3.7. Eye in head, 4; snout, 3.5; interorbital, 2.8; maxillary, 3.5; depth of peduncle, 1.9; its length, 1.3; pectoral, 1.3; ventral, 1.5; longest dorsal ray, 1.5; longest anal ray, 1.6; caudal lobe, 1.3. Barbel in eye, 2.

Dorsal, $9\frac{1}{2}$; anal, 8. Scales, 39. Teeth (from a cotype), 5, 3.

Head and snout blunt; body little compressed; peduncle compressed; breast broad and rather flat. Jaws equal; mouth small, oblique, transverse; maxillary not reaching eye; with a small, slender subterminal barbel, the base of which is concealed behind the broad upper lip; tip of lower jaw squarish; gill-membranes narrowly joined in a fold across the isthmus. No spinous dorsal or anal rays; dorsal origin over that of ventral, slightly nearer tip of snout than base of caudal; pectoral rounded, not reaching ventral; ventral not quite to anal; caudal moderately forked,

the upper lobe the more pointed and the two equal. Scales rather rough, with close-set subparallel striæ; lateral line complete, straight, in the middle of side. Vent at tips of ventrals, three-quarters the distance from their axils to origin of anal.

Blackish above; the color most solid along mid-side; with indistinct pale streaks along back; side below lateral line with alternate dark and silvery streaks of about equal width, and belly paler; lower half of face silvery. Dorsal with a black spot on its front rays, continued backward as a faint shade across the fin; other fins plain.

***Leucogobio tæniellus*, new species**

DESCRIPTION OF THE TYPE.—Number 8422, American Museum of Natural History, from streams in the Min River Basin, near Yenping, Fukien, 1920; collected by H. R. Caldwell.

Length to base of caudal, 55 mm. Depth in length, 3.7; head, 3.8. Eye in head, 3.5; snout, 3.5; interorbital, 3; maxillary, 3.3; depth of peduncle, 1.8; length of peduncle, 1.7; pectoral, 1.4; ventral, 1.6; longest dorsal ray, 1.6; longest anal ray, 1.6; caudal lobe, 1.3. Barbel in eye, 1.5.

Dorsal, 9; anal, 8. Scales, 36.

Moderately compressed; the head rather blunt; vent a little in advance of anal origin. Lower jaw slightly included; mouth moderately oblique; maxillary not reaching front of eye; with a moderate subterminal barbel; gill-membranes narrowly joined to isthmus under edge of preopercle. No spinous dorsal or anal rays; dorsal origin equidistant from tip of snout and base of caudal; ventral origin under that of dorsal; pectoral and ventral rounded; pectoral not quite reaching to ventral, ventral not quite to anal; caudal little forked. Scales with close-set slightly radiating striæ; lateral line complete, in the middle of the side except for a slight rise in front.

Irregularly dark along middle of side; along back; and in one or two lines between. Front of dorsal with a black mark, which is faintly indicated across the fin.

***Gnathopogon punctatus*, new species**

DESCRIPTION OF THE TYPE.—Number 8423, American Museum of Natural History, from near Yenping, Fukien; collected by H. R. Caldwell. Close to *Gnathopogon wolterstorffi* (Regan).

Length to base of caudal, 46 mm. Depth in length, 4.5; head, 3.9. Eye in head, 3; snout 3.4; interorbital, 4; maxillary, 3.6; barbel, 4; greatest width of body (at back of head), 2; depth of peduncle, 2.7; its length, 1.6; pectoral, 1.4; ventral, 1.4; longest dorsal ray, 1.3; longest anal ray, 1.7; caudal lobe, 1.

Dorsal, 10; anal, 8. Scales, 35.

Symmetrical, fusiform, not much compressed; the vent at about one-third the distance from anal origin to ventral axil; breast and belly broadly rounded. Snout bluntly pointed; mouth very slightly oblique; maxillary to almost under front of eye; lower jaw very slightly included; a long slender terminal maxillary barbel; interorbital almost flat; eye large, oval; gill-membranes narrowly joined to isthmus under posterior margin of eye; suborbital crossed by fine subvertical lines of pores. Dorsal and anal without spinous rays; dorsal origin equidistant from the tip of snout and middle of peduncle; very slightly in advance of ventral origin; pectoral not reaching ventral, ventral not reaching anal; caudal narrow, well-forked, with pointed lobes.

Scales with conspicuous wide-spaced radiating striae; lateral line complete, a little bent down, running in center of peduncle.

A series of small dark spots above the lateral line, and a faint plumbeous streak in the center of peduncle.

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