

Preliminary notes on the arrangement of the genus
Gobius, with an enumeration of its european species.

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After having determined and restituted the more than 300 specimens of *Gobius* from the Black-Sea- and Caspian regions which were kindly sent me for examination from the Museum of the Imperial Academy of Sciences of St. Petersburg, for the understanding of my systematical arrangements I will give a brief account of my views on the distinction of the species in this genus, as far as they are represented in the Royal zoological museum of Stockholm, forwarding to a future memoir the full vindication of these views.

The genus *Gobius*, as limited by Dr. GÜNTHER in his well-known *Catalogue*, may be thus divided:

I: Base of the second dorsal fin longer than the length of the head and more than 24 % of the length of the body without caudal.

I, *a*: Length of the head reduced (without opercle) less than 60 % of the length of the base of the anal fin.

A: Number of spines in the first dorsal fin more than 7.

a: Number of scales in a transverse row between the origins of the second dorsal and anal fins more than 20: — *Pterogobius*, GILL.

b: Number of scales in that named row less than 17
— *Chæturichthys*, RICH.

B: Number of spines in the first dorsal fin at most 7:—
Gobionellus, GIR.

I, b: Length of the head reduced more than 60 % of the length of the base of the anal fin.

A: Length of the maxillaries more than 17 % of the length of the body without caudal:—*Quietula*, JORD., EVERM.

B: Length of the maxillaries less than 17 % of the length of the body without caudal.

B, 1: Anterior, tubiform nostril placed in the anterior inferior margin of the preorbital—*Proterorhinus*, nov. subgen. *Gobius marmoratus*, PALL.—

α: Profile of head more or less obtusely rounded.

αα: Length of base of anal fin more than 61 % of the distance of this fin from the tip of the nose—var. *blennioides* (KESSL.).

ββ: Length of base of anal fin less than 61 % of its distance from the tip of the nose—var. *semilunaris* (HECK.).

β: Profile of head anteriorly more or less produced.

αα: Length of base of anal fin less than 61 % (but more than 50 %) of the distance of this fin from the tip of the nose—var. *nasalis* (FIL.) caspia.

ββ: Length of base of anal fin less than 50 % of its distance from the tip of the nose—var. *nasalis*, pontica.

B, 2: Anterior nostril placed higher up in the preorbital area, above its lower margin.

a: Number of scales in a transverse line between the origins of the second dorsal and anal fins more than 14, and above the fore part of the anal fins in a longitudinal line of the length of $\frac{1}{10}$ of the length of the body (without caudal), more than 6.

α : Fore part of the body with the head compressed (breadth of the head less than 80 % of the greatest height of the body); body coloured with complete transverse bands; number of spines in the first dorsal 6—8: — *Amblygobius*, BLKR.

β : Fore part of the body with the head terete (breadth of the head in adults more than 80 % of the greatest height of the body); body coloured with irregular spots or bands, broken in the middle line of the sides.

aa : Number of spines in the first dorsal fin more than 7: — *Acanthogobius*, GILL. (*Amblychæturichthys*, BLKR.).

bb : Number of spines in the first dorsal fin at most 7 (5—7).

$\alpha\alpha$: Fore clavicular margin (in the branchial cavity) provided with a soft rim or some dermal flaps or tubercles.

aaa : Distance between the eye and the hind margin of the preopercle about half the postorbital length of the head — *Ilypnus*, JORD., EVERM.

$\beta\beta\beta$: Distance between the eye and the hind margin of the preopercle less than $\frac{2}{5}$ (< 37 %) of the postorbital length of the head — *Eichwaldia*, nov. subg. — *Gobius caspius*, EICHW.

$\beta\beta$: Fore clavicular margin without protuberances; distance between the eye and the hind preopercular margin more than $\frac{2}{5}$ (> 45 %) of the postorbital length of the head.

$\alpha\alpha\alpha$: Least depth of the tail less than 32 % of the length of the head.

$\alpha\alpha\alpha\alpha$: Length of the base of the anal fin less than 90 % of the length of the head. — *Gobius batrachocephalus*, PALL.

$\alpha\alpha\alpha\alpha\alpha$: Number of scales in a transverse line at the beginning of the second dorsal fin more than 23, in a longitudinal line, above the fore part of the anal fin, as long as the lower jaw, more than 16; length of the head reduced more than $\frac{1}{4}$ of the length of the body (without caudal fin); the whole opercle in adult state usually naked. — forma *batrachocephalus*.

$\beta\beta\beta\beta\beta$: Number of scales in the above-named transverse line at most 23, in the longitudinal line of the above-named length at most 16; length of the head reduced less than 24 % of the length of body; upper part of opercle scaly. — forma *platycephalus*, KESSL. (= *Kessleri*, GTHR.) + *eurystomus*, KESSL.

$\beta\beta\beta\beta$: Length of the base of the anal fin more than 90 % of the length of the head. — *Gobius fluviatilis*, PALL.

$\alpha\alpha\alpha\alpha\alpha$: Length of the base of the second dorsal fin more than 38 % of the length of the body (without caudal fin). — forma *cepypterus* (KESSL.).

$\beta\beta\beta\beta\beta$: Length of the base of the second dorsal fin less than 38 % of the length of the body. — forma *fluviatilis*, incl. *Gobius gymnotrachelus*, KESSL.

$\beta\beta\beta$: Least depth of the tail more than 32 % of the length of the head.

$\alpha\alpha\alpha\alpha$: Least depth of the tail less than 32 % of the length of the base of the second dorsal fin, which is more

than 35 % of the length of the body (without caudal fin). — *Gobius cephalarges*, PALL.

Varieties:

1: in the Black-Sea-region.

a) Longitudinal diameter of the eye less than 41 % of the length of the cheek (from the end of the maxillary to the hind margin of the preopercle) or 69 % of the length of the nose. — *Gob. eurycephalus*, KESSL. + *platyrostris*, PALL., KESSL. + *cephalarges*, PALL.

b) Longitudinal diameter of the eye more than 45 % of the length of the cheek or 70 % of the length of the nose. — *Gob. ratan.*, NORDM. + *syрман*, NORDM. + *Trautvetteri*, KESSL.

2: in the Caspian region.

a) Least depth of the tail more than 10.8 % of the length of the body (without caudal fin) or 28.9 % of the length of the base of the second dorsal fin.

aa) Length of the head more than 83 %, distance between the origin of the first dorsal fin and the tip of the nose more than 92 %, length of the ventral fin more than 56 %, length of the lower jaw less than 36 % of the length of the base of the second dorsal fin. — *Gobius Goebelii*, KESSL.

bb) Length of the head less than 80 %, distance between the first dorsal fin and the tip of the nose less than 87 %, length of the ventral fin less than 55 %, length of the lower jaw more than 39 % of the length of the base of the second dorsal fin. — *Gobius Bogdanowii*, KESSL.

b) Least depth of the tail less than 10.6 % (but more than 9 %) of the length of the body or 28.5 % of the length of the base of the second dorsal fin.

aa) Length of the head more than 82.5 %, length of the head reduced more than

64.9 %, distance from the tip of the nose to the first dorsal fin more than 95 %, length of the ventral fin more than 54 % of the length of the base of the second dorsal fin; length of the ventral fin more than 78 % of the length of the pectoral. — *Gob. Weidemanni*, KESSL.

bb) Length of the head less than 82.5 %, length of the head reduced less than 64.6 %, distance from the tip of the nose to the first dorsal fin less than 95 %, length of the ventral fin less than 54 % of the length of the base of the second dorsal fin; length of the ventral fin less than 78 % of the pectoral. — *Gob. cyrius*, KESSL.

ββββ: Least depth of the tail more than 32 % of the length of the base of the second dorsal fin, which is less than 35 % of the length of the body.

ααααα: Length of the base of the anal fin more than 43 % of the distance between the tip of the nose and the beginning of the second dorsal fin.

αααααα: Length of the nose more than 8 % of the length of the body (without caudal fin). — *Gobius melanostomus*, PALL.

ββββββ: Length of the nose less than 8 % of the length of the body. — *Gobius ophiocephalus*, PALL.

1: Length of the base of the second dorsal fin more than 33 % of the length of the body (without caudal fin) — forma *lynx* (KESSL.).

2: Length of the base of the second dorsal fin less than 33 % of the length of the body (without caudal fin). — forma *ophiocephalus*.

$\beta\beta\beta\beta$: Length of the base of the anal fin less than 43 % of the distance between the tip of the nose and the beginning of the second dorsal fin.

1: Number of rays in the pectoral fins at most 16. — *Gobius avernensis*, CSTR.

2: Number of rays in the pectoral fins more than 16. — *Gobius paganellus*, LIN.

x : Number of rays in the anal fin 10—12 (13); length of ventral fins usually less than 20 % of the length of the body, without caudal fin — var. *capito* (C., VAL.) incl. *guttatus*, *limbatus*, *geniporus* + *quadrivittatus* (STEIND.).

xx : Number of rays in the anal fin (13) 14—15, var. *punctipinnis* (CSTR.); length of ventral fins usually less than 21 % of the length of body.

xxx : Number of rays in the anal fin 14—15, var. *auratus* (RISSO) incl. *cruentatus*; length of ventral fins usually more than 21 % of the length of body, without caudal fin.

b : Number of scales in a transverse line, between the beginning of the second dorsal fin and that of the anal fin, less than 14 but more than 11; and in a longitudinal line, of the length of $\frac{1}{10}$ of the length of the body (without caudal fin), above the fore part of the anal fin, 5 or 6. — *Gobius niger*, LIN., incl. *Gob. jozo*, LIN.

aa : Number of rays in the pectoral fins more than 16 — forma *niger*.

$\beta\beta$: Number of rays in the pectoral fins less than 15 — forma *Bonelli* (NARDO).

c : Number of scales in a transverse line, between the beginning of the second dorsal and that of the anal fin, less than 11 — *Parachæturichthys*, BLKR.

aa : Length of the head more than 24 % of the length of the body (without caudal fin); length of the head reduced more

than half the distance between the tip of the nose and the beginning of the first dorsal fin; number of rays in the pectoral fins more than 16.

$\alpha\alpha$: Least depth of the tail more than half the distance between the end of the second dorsal fin and the first dorsal supporting ray of the caudal fin.

$\alpha\alpha\alpha$: Least depth of the tail less than the length of the mandible.

$\alpha\alpha\alpha\alpha$: Longitudinal diameter of the eye more than $\frac{1}{3}$ of the length of the head reduced. — *Gobius Lesueurii*, RISSO, incl. *Gob. gracilis*, FR. (*Friesii*, MALM).

Varieties:

1: Nape scaly.

var. α : Length of the lower jaw more than 48 %, length of the head reduced (from tip of the nose to hind margin of preopercle) more than 78 % of the length of the base of the anal fin — mediterranean.

var. β : Length of lower jaw less than 48 (47.1) %, length of the head reduced less than 78 (77.1) % of the base of the anal fin. — forma *Friesii* — atlantic, boreal.

2: Nape scaleless.

var. γ : Length of the lower jaw less than 48 (47.1) %, length of the head reduced less than 78 (77.1) % of the base of the anal fin. — forma *Lesueurii* — mediterranean.

II: Base of the second dorsal fin shorter than the head and less than 24 % of the length of the body.

A: Caudal peduncle relatively short: length of the dorsal margin of the caudal peduncle (from the end of the second dorsal fin to the first upper supporting ray of the caudal fin) less than 15 % of the length of the body (without caudal fin), at least in adult state.

α : Maxillary longer than the nose and the eye together.
— *Gillichthys*, COOP.

b : Maxillary shorter than the length of the nose and the eye together.

b_1 : Number of scales in a transverse line between the origins of the second dorsal and anal fins more than 17. — *Caffrogobius* n. subg. (type *Gobius nudiceps*).

b_2 : Number of scales in a transverse line between the origins of the second dorsal and anal fins less than 17.

α : Length of the nose more than $\frac{1}{10}$ of the length of the body (without caudal fin). — *Awaous*, VAL.

β : Length of the nose less than $\frac{1}{10}$ of the length of the body.

$\alpha\alpha$: Number of scales in a transverse row between the origins of the second dorsal and anal fins more than 10. — *Mapo*, n. subg. *Mapo soporator* (CUV., VAL.).

$\alpha\alpha\alpha$: Length of the cheek (from the hind end of the maxillary to the hind margin of the preopercle) more than 33 % of the distance from the tip of the nose to the origin of the first dorsal. — forma *americana* (America — mediterranean?).

$\beta\beta\beta$: Length of the cheek less than 33 % of the distance between the tip of the

nose and the origin of the first dorsal fin — forma *africana* (Cameroon — mediterranean?).

$\beta\beta$: Number of scales in a transverse row between the origins of the second dorsal and anal fins less than 10. Fore part of back and nape scaleless. *Paragobiodon*, BLKR.

B: Caudal peduncle long: length of the dorsal margin of the caudal peduncle more than 15% of the length of the body.

a: Length of the lower jaw more than 14% of the length of the body (without caudal fin). — *Glossogobius*, GILL. To this subgenus belongs the *Gobius colonianus*, RISSO.

b: Length of the lower jaw less than 14% of the length of the body.

aa: Least height of the tail more than 60% of the length of the base of the anal fin.

aaa: Length of the base of the anal fin less than 14% of the length of the body (without caudal fin) — *Cephalogobius*, BLKR.

bbb: Length of the base of the anal fin more than 14% of the length of the body.

α : Interorbital breadth more than 20% of the length of the head. — *Mugilogobius*, n. subg from India and Japan.

β : Interorbital breadth less than 15% of the length of the head.

$\alpha\alpha$: Length of the ventral fin more than 33% of the distance between the tip of the nose and the origin of the anal fin.

$\alpha\alpha\alpha$: Length of the dorsal margin of the caudal peduncle more than 26% of the length of the body (without caudal); least depth of the tail less than half the length of that margin; length of

the base of the second dorsal fin less than 22 % of the length of the body: — *Lophogobius*, GILL.

$\beta\beta$: Length of the dorsal margin of the caudal peduncle less than 17 % of the length of the body and less than two times the least height of the tail; length of the base of the second dorsal fin more than 22 % of the length of the body. — *Porogobius*, BLKR.

$\beta\beta$: Length of the ventral fin less than 33 % of the distance between the tip of the nose and the origin of the anal fin. — *Acentrogobius*, BLKR. (= *Ctenogobius*, BLKR.? nec. GILL.); group of the *caninus*-type.

bb: Least height of the tail less than 60 % of the length of the base of the anal fin.

α : Least depth of the tail more than 7.5 % of the length of the body (without caudal fin).

aa: Cheek (distance from the hind end of the maxillary to the hind margin of the preopercle) shorter than the postorbital part of the head. *Coryphopterus*, GILL. (?).

aaa: Number of scales in a transverse row between the origins of the second dorsal and anal fins more than 8.

aaaa: Length of the base of the second dorsal fin more than 22 % of the length of the body (without caudal fin). — *Gobius criniger*, CUV., VAL. Black Sea (?), one specimen in the Mus. Acad. Petersburg, taken by RADDE.

$\beta\beta\beta\beta$: Length of the base of the second dorsal fin less than 22 % of the length of the body. — *Gobius flavescens*, FABR.

- 1: Number of rays in the first dorsal fin 6 (exceptionally 5); length of this fin, from the first to the last ray (incl.) less than $\frac{1}{3}$ of the distance of the fin from the tip of the nose.
- a*: Interorbital breadth more than 10% of the length of the head or 70% of the longitudinal diameter of the eye — var. *lenkoranicus* (KESSL.).
- b*: Interorbital breadth less than 10% of the length of the head or 70% of the longitudinal diameter of the eye — var. *microps* (KRØYER).
- 2: Number of rays in the first dorsal fin 7 or 8; length of this fin, from the first to the last ray (incl.) more than $\frac{1}{3}$ of the distance of the fin from the tip of the nose. — var. *Ruthensparri* (EUPHR.).
- $\beta\beta\beta$: Number of scales in a transverse row between the origins of the second dorsal and the anal fins less than 8. — *Gobius Jeffreysii*, GTHR.
- $\beta\beta$: Cheek longer than the postorbital part of the head. — *Lebetus*, WINTHER. — *Gobius scorpioides*, COLL. (σ = *Gob. orca*, COLL.).
- β : Least depth of the tail less than 7.5% of the length of the body.
- $\alpha\alpha$: Number of scales in a transverse row between the origins of the second dorsal and the anal fins less than 12. — *Deltentosteus*, GILL.
- $\alpha\alpha\alpha$: Length of the ventral fin more than $\frac{1}{4}$ of the length of the body (without caudal fin).
- $\alpha\alpha\alpha\alpha$: Least depth of the tail more than 33% of the distance between the origins of the first and the second dorsal fins. — *Gob. elongatus*, CANESTR.

$\beta\beta\beta\beta$: Least depth of the tail less than 31 % of the distance between the origins of the first and the second dorsal fins. — *Gob. quagga*, HECK.

$\beta\beta\beta$: Length of the ventral fin less than $\frac{1}{4}$ of the length of the body.

$\alpha\alpha\alpha\alpha$: Longitudinal diameter of the eye less than 50 % of the length of the postorbital part of the head. — *Gob. longecaudatus*, KESSL. (= *Gob. leopardinus*, NORDM.?).

$\beta\beta\beta\beta$: Longitudinal diameter of the eye more than 61 % of the length of the postorbital part of the head. — *Gob. quadrimaculatus*, CUV., VAL.

$\beta\beta$: Number of scales in a transverse row between the origins of the second dorsal and the anal fins more than 12. — *Pomatoschistus*, GILL.

Longitudinal diameter of the eye less than 61 % of the length of the postorbital part of the head. — *Gobius minutus*, PALL.
