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The Sculpins (Perciformes: Cottidae) of Lake Baikal and Baikal region: updated checklist with the description of new taxa

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ABSTRACT. The updated checklist of sculpins of Lake Baikal and its adjacent basins with data on nomenclature, diagnostic characters and distribution is presented. Currently, 42 species (38 of which are endemics to Lake Baikal) belonging to ten genera and seven subgenera of the family Cottidae have been recorded in Lake Baikal and Baikal region. The new genera *Adipocottus* and *Alpinocottus* and the subgenus *Korotnevia* have been described.

Keywords: Cottidae, nomenclature, taxonomy, diagnostic characters, Lake Baikal, Baikal region.

1. Introduction

According to modern data on the phylogeny and classification of bony fishes (Smith and Busby, 2014; Betancur-R et al., 2017), six to nine families belong to the Cottoids (infraorder Cottales: suborder Cottoidei: order Perciformes). The family Cottidae (sculpins) is one of them. Nowadays, it includes all freshwater sculpins (about 110 species) and one marine species *Leptocottus armatus*. All other marine sculpins (about 200 species) are excluded from it. The Baikal sculpins are interesting because they are account for about one-third of the species of the family Cottidae and more than two-thirds of the fish species diversity in Lake Baikal. The aim of this article is to present the updated checklist of the sculpins of Lake Baikal and Baikal region, including corrected nomenclatural data, diagnostic fitches and information on distribution and descriptions of new taxa.

2. Materials and methods

Descriptions of taxa are given on published data and the results of a study of collections of cottoid fish from the funds of the Laboratory of Ichthyology of the Limnological Institute of the Siberian Branch of the Russian Academy of Sciences, including those collected by the author in the period 2000-2017.

The study uses data from both printed and digitized sources posted on Internet resources: Internet archive (https://archive.org), Biodiversity Heritage Library (https://www.biodiversitylibrary.org)

Nomenclature data are given in accordance with the International Code of Zoological Nomenclature (International Trust for Zoological Nomenclature, 1999), hereinafter "the Code" and the Catalog of fishes (Eschmeyer's Catalog, 2023).

3. The basic terms and definitions of nomenclature.

A holotype (Art. 73.1 of the Code) is the single specimen upon which a new nominal species-group taxon is based in the original publication. If an author when establishing a new nominal species-group taxon states in the original publication that one specimen, and only one, is the holotype, or "the type", or uses some equivalent expression, that specimen is the holotype fixed by original designation. If the nominal species-group taxon is based on a single specimen, either so stated or implied in the original publication, that specimen is the holotype fixed by monotypy. If the taxon was established before 2000 evidence derived from outside the work itself may be taken into account to help identify the specimen. Designation of an illustration of a single specimen as a holotype is to be treated as designation of the specimen illustrated; the fact that the specimen no longer exists or cannot be traced does not of itself invalidate the designation.

Syntypes (Art. 73.2 of the Code) are specimens of a type series that collectively constitute the name-bearing type. They may have been expressly designated as syntypes; for a nominal species-group taxon established before 2000 all the specimens of the type

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series are automatically syntypes if neither a holotype nor a lectotype has been fixed. When a nominal species-group taxon has syntypes, all have equal status in nomenclature as components of the name-bearing type.

A lectotype (Art. 74 of the Code) may be designated from syntypes to become the unique bearer of the name of a nominal species-group taxon and the standard for its application. The valid designation of a lectotype fixes the status of the specimen as the sole name-bearing type of that nominal taxon; no later designation of a lectotype has any validity. The valid designation of a lectotype supersedes any previous restriction of the application of the name of the taxon. The valid designation of a lectotype permanently deprives all other specimens that were formerly syntypes of that nominal taxon of the status of syntype; those specimens then become paralectotypes.

If it is demonstrated that a specimen designated as a lectotype was not a syntype, it loses its status of lectotype. Lectotypes must not be designated collectively by a general statement; each designation must be made specifically for one nominal taxon and must have as its object the definition of that taxon. Designation of an illustration or description of a syntype as a lectotype is to be treated as designation of the specimen illustrated or described; the fact that the specimen no longer exists or cannot be traced does not of itself invalidate the designation.

In a lectotype designation made before 2000, either the term “lectotype”, or an exact translation or equivalent expression (e.g. “the type”), must have been used or the author must have unambiguously selected a particular syntype to act as the unique name-bearing type of the taxon. When the original work reveals that the taxon had been based on more than one specimen, a subsequent use of the term “holotype” does not constitute a valid lectotype designation unless the author, when wrongly using that term, explicitly indicated that he or she was selecting from the type series that particular specimen to serve as the name-bearing type.

A neotype (Art. 75 of the Code) is the name-bearing type of a nominal species-group taxon designated under conditions specified below when no name-bearing type specimen (i.e. holotype, lectotype, syntype or prior neotype) is believed to be extant and an author considers that a name-bearing type is necessary to define the nominal taxon objectively. The continued existence of paratypes or paralectotypes does not in itself preclude the designation of a neotype. A neotype is not to be designated as an end in itself, or as a matter of curatorial routine, and any such neotype designation is invalid.

A neotype is validly designated when there is an exceptional need and only when that need is stated expressly and when the designation is published with the following particulars:a statement that it is designated with the express purpose of clarifying the taxonomic status or the type locality of a nominal taxon;a statement of the characters that the author regards as differentiating from other taxa the nominal species-group taxon for which the neotype is designated, or a bibliographic reference to such a statement; data and description sufficient to ensure recognition of the specimen designated; the author’s reasons for believing the name-bearing type specimen(s) (i.e. holotype, or lectotype, or all syntypes, or prior neotype) to be lost or destroyed, and the steps that had been taken to trace it or them; evidence that the neotype is consistent with what is known of the former name-bearing type from the original description and from other sources; however, a neotype may be based on a different sex or life stage, if necessary or desirable to secure stability of nomenclature; evidence that the neotype came as nearly as practicable from the original type locality; a statement that the neotype is, or immediately upon publication has become, the property of a recognized scientific or educational institution, cited by name, that maintains a research collection, with proper facilities for preserving name-bearing types, and that makes them accessible for study.

The type locality (Art. 76 of the Code) of a nominal species-group taxon is the geographical place of capture, collection or observation of the name-bearing type; if there are syntypes and no lectotype has been designated, the type locality encompasses the localities of all of them. The place of origin of the lectotype becomes the type locality of the nominal species-group taxon, despite any previously published statement of the type locality. The place of origin of the neotype becomes the type locality of the nominal species-group taxon, despite any previously published statement of the type locality.

Abbreviations of museum and voucher collections:

BM ISU - Baikal Museum of Irkutsk State University, Russia;

BMNH - Natural History Museum, London;

LIN - Limnological Institute SB RAS, Irkutsk, Russia;

MNHN - Muséum National d’Histoire Naturelle, Paris;

NM RGS - Nature Museum of Russian Geographical Society (now the Nature Museum of the Irkutsk Museum of Local Lore), Irkutsk;

NMW - Naturhistorisches Museum, Wien, Austria.

ZISP - Zoological Institute RAS, St.-Petersburg, Russia;

ZMB - Humboldt-Universität, Museum für Naturkunde, Zoologisches Museum, Vertebraten (Wirbekltiere), Ichthyologie, Berlin;

ZM KNU - Zoological Museum of Kiev National University, Ukraine;

ZMMSU - Zoological Museum of Moscow State University, Russia.

Abbreviations of diagnostic characters: *TL* - absolute length; D_1, D_2, *P*, *A*, - number of rays in first dorsal, second dorsal, pectoral and anal fins; *sp.br.* - number of gill rakers; *l.l.* - number of pores or free neuromasts in the lateral line; *l.so.*, *l.io.*, *l.t.*, *l.oc.*, *l.pm.* - number of free neuromasts in the supraorbital, infraorbital, temporal, occipital and preopercular-mandibular sensory lines.

4. Results and discussion

Family Cottidae Bonaparte, 1831 – Sculpins

Cottini Bonaparte: 1831: 90, 103; as the tribe of the family Triglidae.

Tribe Abyssocottini Berg, 1907 – Deep-water sculpins

Abyssocottini Berg, 1907: 38; *Abyssocottus* Berg, 1906 type by original designation.

The taxonomic composition of the tribe is equal to the subfamily *Abyssocottini* (*-nae*) sensu Berg (1907) and Bogutskaya & Naseka (2004). The tribe includes genera of deep-water sculpins endemic to Baikal. Their distinctive features are three soft rays in the ventral fin and 9-16 rays in the anal fin.

Based on morphological and molecular data (Taliev, 1955; Kontula et al., 2003; Teterina et al., 2022), the genus Abyssocottus is accepted in a taxonomic volume equal to the subfamily Abyssocottinae (sensu Taliev, 1955), with division into subgenera: *Abyssocottus, Asprocottus, Cottinella, Limnocottus, Neocottus* and *Korotnevia* (subgenus.nov).

For deep-water species of the genus *Batrachocottus* (B. *nikolskii, B. multiradiatus, B. talievi*), a new genus *Adipocottus* (gen.nov) is established. It is phylogenetically close to the genus *Abyssocottus*, but morphologically differs significantly from it. Accordingly, only one species of B. baicalensis remains in the genus *Batrachocottus*.

Genus *Abyssocottus* Berg, 1906 – Deep-water sculpins

Abyssocottus Berg, 1906: 908. Masc.; type species: *Abyssocottus korotneffi* Berg 1906, by original designation.

Description. The surface of the head is embossed due to the protruding parts of the *etmoideum, prefrontale, frontale* and *suborbitale*. There are 1-5 spines or their rudiments on the *preoperculum*. The skin is naked or covered with spicules. The sensory system is represented by free neuromasts grouped in lines that replicate the topography of sensory canals. There are additional rows of neuromasts on the head and body, the location of which is not related to the topography of the canals. Neuromasts are located in the epidermal pits, on knob-liked elevations or on skin papillae.

Subgenus *Abyssocottus* Berg, 1906

Abyssocottus Berg, 1906: 908. Masc.; type species: *Abyssocottus korotneffi* Berg 1906, by original designation.

Description. The head is strongly flattened. The crests on the suborbital and frontal bones are poorly developed. There is one small sharp spine on the preoperculum. The eyes are small, round, in large oval orbits. Skin is naked. Neuromasts are located in the epidermal pits or on short knob-liked skin papillae (in the anterior part of the suborbital line).

***Abyssocottus (Abyssocottus) fuscus* Bogdanov, 2014 – Brownish sculpin**

Abyssocottus fuscus Bogdanov, 2013: 93; fig. 1, 2 (published in March 2014). Holotype BM ISU 395 (ex LIN 294-09-26); paratypes: LIN 005-07-08, 017-08-04, 014-09-05, 015-09-05, 049-09-13, 078-09-20, 079-09-20, 230-09-23, 231-09-23, 291-09-26, 292-09-26, 293-09-26, 294-09-26, 295-09-26, 296-09-26; Baikal, Cape Svyatoi Nos, depth 500-550 m.

Description. Length (TL) reaches 130-135 mm, weight is up to 20-25 g. Coloration is monotone brown; D_1 4-5; D_2 13-15; P 14-15; *V* I,3; *A* 12-15; *sp.br.* 6-8, *l.so.* 5-12, *l.io.* 16-23, *l.t.* 3-4, *l.oc.* 1, *l.pm.* 20-30, *l.l.* 50-65.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 500 to 950 m.

Examined material: type specimens.

References: (Bogdanov, 2013).

***Abyssocottus (Abyssocottus) korotneffi* Berg, 1906 – Small-eyed sculpin**

Abyssocottus korotneffi Berg, 1906: 908. Lake Baikal, depth 180-1600 m. Lectotype: ZISP 13733 designated by Berg (1907: 47, Taf. V, fig. 3a); Lake Baikal, near Goremyki (now Baikalskoye) village, depth 180 m. Paralectotypes (5) collections No 14, 38, 40, 47 and 60 by prof. A. Korotnev [Korotneff] probably at ZM KNU.

Description. Length (TL) reaches 130-135 mm, weight is up to 20-25 g. Coloration is monotone, light orange or light yellow; D_1 3-6; D_2 12-15; P 13-16; *V* I,3; *A* 11-15; *sp.br.* 5-9, *l.so.* 8-13, *l.io.* 18-23, *l.t.* 2-5, *l.oc.* 1-2, *l.pm.* 21-30, *l.l.* 53-63.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 170 to 1600 m.

Examined material: 20 specimens.

References: (Berg, 1906, 1907; Bogdanov, 2013).

***Abyssocottus (Abyssocottus) pumilus* Bogdanov, 2014 – dwarf deep-water sculpin**

Abyssocottus pumilus Bogdanov, 2013: 93; fig. 1, 2 (published in March 2014). Holotype: BM ISU 396 (ex LIN 173-06-32); paratypes: LIN 298-09-26 (12); Lake Baikal opposite Buguldeika village, depth 508-517 m.

Description. Length (TL) reaches 50-60 mm, weight is up to 1-2 g. Coloration is monotone light brown or light grey; D_1 5-6; D_2 13-15; P 13-15; *V* I,3; *A* 11-14; *sp.br.* 6-8, *l.so.* 9-11, *l.io.* 15-16, *l.t.* 4, *l.oc.* 1, *l.pm.* 17, *l.l.* 32-38.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 400 to 1050 m.

Examined material: type specimens.

References: (Bogdanov, 2013).

Subgenus *Asprocottus* Berg, 1906

Asprocottus Berg, 1906: 907. Masc.; type species: *Asprocottus herzensteini* Berg 1906, by monotypy.

Description. The head is moderately flattened. The ridges on the suborbital and frontal bones are well or moderately developed. There are 3-5 sharp spines on the preoperculum. Bony spicules or their rudiments cover the entire upper part of the body, or are located only under the pectoral fins. Neuromasts are located on tubercles and papillae.

***Abyssocottus (Asprocottus) abyssalis* (Taliev, 1955) – Deep-water rough sculpin**

Asprocottus herzensteini abyssalis Taliev, 1955: 69, fig. 10, 29, 37, 128, 129. Syntypes (25) whereabouts is unknown; Lake Baikal, Bay Listvenichny, depth 877 m. Specimen ZISP 46633 established as a neotype by Sideleva (2003: 181) is invalid, since it is designated without specifying the exceptional necessity of this

action (article 75.2, 75.3 of the Code). If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image (Taliev, 1955: fig. 128), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of the Code).

Description. Length (TL) reaches 72 mm, weight is up to 4 g. Coloration monotone light grey or light pinky-grey; D_1 5-8; D_2 13-16; P 13-16; *V* I,3; *A* 12-14; *sp.br.* 6-8, *l.so.* 8-12, *l.io.* 14-20, *l.t.* 4-6, *l.oc.* 1-4 (or absent), *l.pm.* 18-23, *l.l.* 31-46.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 150 to 1400 m.

Examined material: 14 specimens.

References: (Taliev, 1955; Sideleva, 2003; Bogdanov, 2018).

***Abyssocottus (Asprocottus) herzensteini* (Berg, 1906) – Rough sculpin**

Asprocottus herzensteini Berg, 1906: 907. Lectotype: ZISP 13740 designated by Berg (1907: 55; Fig. 14; Taf. V, fig. 1); Lake Baikal. Paralectotypes (3) whereabouts is unknown.

Description. Length (TL) reaches 117 mm, weight is up to 17.5 g. Coloration monotone grey or pinky-grey; D_1 6-7; D_2 13-16; P 15-17; *V* I,3; *A* 12-15; *sp.br.* 5-8, *l.so.* 9-12, *l.io.* 17-22, *l.t.* 2-4, *l.oc.* 1-3, *l.pm.* 19-25, *l.l.* 34-50.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 200 to 800 м.

Examined material: 22 specimens

References: (Berg, 1906, 1907; Bogdanov, 2018).

***Abyssocottus (Asprocottus) intermedius* (Taliev, 1955) – Half-naked sculpin**

Asprocottus herzensteini intermedius Taliev, 1955: 69, fig. 29, 132, 133. Syntypes (7) whereabouts is unknown; Lake Baikal, northern part, depth 30-330 m (Taliev, 1955). If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image (Taliev, 1955: fig. 132), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of the Code).

Description. Length (TL) reaches 87 mm, weight is up to 7.5 g. Coloration light brown-grey with dark spots; D_1 5-7; D_2 15-17; P 13-17; *V* I,3; *A* 14-17; *sp.br.* 4-7, *l.so.* 9-12, *l.io.* 14-18, *l.t.* 6-6, *l.oc.* 1-3, *l.pm.* 19-26, *l.l.* 42-61.

Distribution. Endemic to Lake Baikal: it inhabits the sandy-muddy bottom at depths from 30 to 350 m.

Examined material: 17 specimens.

References: (Taliev, 1955; Bogdanov, 2018).

***Abyssocottus (Asprocottus) korjakovi* (Sideleva, 2001) – Koryakov's sculpin**

Asprocottus korjakovi Sideleva, 2001: 61, fig. 1; (holotype ZISP 50871, paratypes (4) ZISP 52086; Lake Baikal, Maloye More Strait, depth 115-125 м).

Asprocottus korjakovi minor Sideleva, 2001: 64; (holotype ZISP 49704, paratypes (5) ZISP 52088; Lake Baikal, Selenginskoye shoal, depth 250 м).

Description. Length (TL) of large form (*A. korjakovi korjakovi*) reaches 123 mm, weight is up to 28 g. The specimens of small form (*A. korjakovi minor*) reaches to 88 mm, and 8 g. Coloration light brown-grey with dark spots; D_1 3-7; D_2 13-17; P 13-16; *V* I,3; *A* 13-16; *sp.br.* 4-7, *l.so.* 6-12, *l.io.* 14-20, *l.t.* 1-5, *l.oc.* 1-3, *l.pm.* 16-24, *l.l.* 31-48.

Distribution. Endemic to Lake Baikal: it inhabits the muddy and sandy-muddy bottom at depths from 50 to 350-450 m.

Examined material: 58 specimens.

References: (Sideleva, 2001; Bogdanov, 2018).

***Abyssocottus (Asprocottus) parmiferus* (Taliev, 1955) – Armored sculpin**

Asprocottus herzensteini parmiferus Taliev, 1955: 68, fig. 43, 69, 127. Syntypes (5) whereabouts is unknown; Lake Baikal, Bay Listvenichny, depth 22 m (Taliev, 1955). Specimen ZISP 49702 established as a neotype by Sideleva (2003: 185) is invalid, since it is designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code). If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image (Taliev, 1955: fig. 127), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of the Code).

Description. Length (TL) reaches 78 mm, weight is up to 8 g. Coloration brown, red-brown or pinky-red with dark spots; D_1 4-7; D_2 13-16; P 14-17; *V* I,3; *A* 12-15; *sp.br.* 4-6, *l.so.* 6-10, *l.io.* 11-19, *l.t.* 2-4, *l.oc.* 1-3, *l.pm.* 11-21, *l.l.* 20-40.

Distribution. Endemic to Lake Baikal: it inhabits the stony and sandy-stony bottom at depths from 20 to 300-350 m.

Examined material: 14 specimens.

References: (Taliev, 1955; Sideleva, 2003; Bogdanov, 2018).

***Abyssocottus (Asprocottus) platycephalus* (Taliev, 1955) – Flathead sculpin**

Asprocottus herzensteini platycephalus Taliev, 1955: 68, fig. 23, 29, 43, 130, 131. Syntypes (6) whereabouts is unknown; Lake Baikal, northern part, depth 170 m (Taliev, 1955). Specimen ZISP 46863 established as a neotype by Sideleva (2003: 187) is invalid, since it is designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code). If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image (Taliev, 1955: fig. 130), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of the Code).

Description. Length (TL) reaches 110 mm, weight is up to 12 g. Coloration light brown-grey or pinky-grey with dark spots; D_1 4-7; D_2 13-17; P 13-15; *V* I,3; *A* 12-17; *sp.br.* 4-8, *l.so.* 6-10, *l.io.* 13-17, *l.t.* 2-4, *l.oc.* 1-2 (or absent), *l.pm.* 15-19, *l.l.* (30) 32-42.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 50 to 800 m.

Examined material: 68 specimens.

References: (Taliev, 1955; Sideleva, 2003; Bogdanov, 2018).

***Abyssocottus (Asprocottus) pulcher* (Taliev, 1955) – Sharp-snout sculpin**

Asprocottus pulcher Taliev, 1955: 69, fig. 23, 29, 134, 135. Syntypes (12) whereabouts is unknown; Lake Baikal, northern part, bays Ayaya and Frolikha, depth 57-310 m. Specimen ZISP 50873 established as a neotype by Sideleva (2003: 188) is invalid, since it designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code). If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image (Taliev, 1955: fig. 134), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of the Code).

Description. Length (TL) reaches 108 mm, weight is up to 14.5 g. Coloration light brown with dark spots; D_1 5-7; D_2 15-17; P 14-16; *V* I,3; *A* 14-16; *sp.br.* 5-9, *l.so.* 8-12, *l.io.* 15-20, *l.t.* 4-6, *l.oc.* 1-3 (or absent), *l.pm.* 17-26, *l.l.* 32-67.

Distribution. Endemic to Lake Baikal: it inhabits the sandy-muddy bottom at depths from 50 to 300 m.

Examined material: 30 specimens

References: (Taliev, 1955; Sideleva, 2003; Bogdanov, 2018).

Subenus *Cottinella* Berg, 1907

Cottinella Berg, 1907: 43. Fem.; as a subgenus of the genus *Abyssocottus*; type species: *Abyssocottus boulengeri* Berg 1906, by monotypy.

Description. The head is wide and high. The crests on the suborbital and frontal bones are poorly developed. There are four well-developed sharp spines on the preoperculum. The eyes are round, of medium size, occupy the entire eye socket. There are no bone spicules on the body. Neuromasts are large with a high cupula in the form of tubercles.

***Abyssocottus (Cottinella) boulengeri* Berg, 1906 – Short-head sculpin**

Abyssocottus boulengeri Berg 1906: 908. Lectotype ZISP 13736 designated by Berg (1907: 45, Taf. V, fig 2a, b); Lake Baikal, opposite cape Boro-Yelga, depth 1600 m Paralectotypes (3) collections No1 and 16 by prof. A. Korotnev [Korotneff] probably at ZM KNU.

Description. Length (TL) reaches 130 mm, weight is up to 40 g. Coloration monotone light or dark brown, grey or pinky-grey; D_1 4-6; D_2 14-16; P 16-17; *V* I,3; *A* 11-13; *sp.br.* 5-7, *l.so.* 8-11, *l.io.* 13-17, *l.t.* 3-5, *l.oc.* 1-2, *l.pm.* 14-20, *l.l.* 33-41.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 300 to 1600 m.

Examined material: 21 specimens.

References: (Berg, 1906, 1907; Taliev, 1955).

Subgenus *Cyphocottus* Sideleva, 2003

Cyphocottus Sideleva, 2003: 191. Masc.; type species: *Cottus megalops* Gratzianov 1902, by original designation.

Description. The head is moderately flattened. The crests on the suborbital and frontal bones are well developed. There is one flat spike with a rounded top on the preoperculum. The eyes are round or oval, of medium or big size. There are bony spicules only under the pectoral fins. Neuromasts are large with a high cupula in the form of tubercles, or situated in epidermal pits.

***Abyssocottus (Cyphocottus) eurystomus* (Taliev, 1955) – Broad-snout sculpin**

Asprocottus megalops eurystomus Taliev, 1955: 332, fig. 138, 139. Syntypes (16 + 10) whereabouts is unknown; Lake Baikal, Selenginskoye shoal and Listvenichny bay. Specimen ZISP 46624 established as a neotype by Sideleva (2003: 188) is invalid, since it is designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code). If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image (Taliev, 1955: fig. 138), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of the Code).

Description. It is polymorphic species. Maximum length (TL) and weight vary from 96 mm and 14 g to 215 mm and 170 g in different populations. Coloration is monotone or spotted, top is of various shades of brown or grey, bottom is white; D_1 5-8; D_2 14-18; P 15-18; *V* I,3; *A* 11-15; *sp.br.* 5-8, *l.so.* 10-20, *l.io.* 17-28, *l.t.* 4-10, *l.oc.* 1-6, *l.pm.* 19-36, *l.l.* 48-122. Neuromasts are large with a high cupula in the form of tubercles.

Distribution. Endemic to Lake Baikal: it inhabits the sandy-muddy and stony-muddy bottom at depths from 30 to 800 m.

Examined material: 183 specimens

References: (Taliev, 1955; Bogdanov, 2021).

***Abyssocottus (Cyphocottus) megalops* (Gratzianow, 1902) – Hump-back [Big-eyed] sculpin**

Cottus megalops Gratzianov 1902: 38. Holotype by monotypy ZISP 9971; Lake Baikal, northern part, Kicherskaya bay.

Limnocottus megalops elegans Taliev, 1955: 329, fig. 136, 137. Syntypes (11) whereabouts is unknown; Lake Baikal, northern part.

Description. Length (TL) reaches 130 mm, weight is up to 20 g. Coloration monotone yellow-grey or light brown; D_1 6-8; D_2 15-18; P 14-16; *V* I,3; *A* 12-15; *sp.br.* 6-9, *l.so.* 12-17, *l.io.* 19-24, *l.t.* 5-9, *l.oc.* 2-4, *l.pm.* 23-31, *l.l.* 39-89. The neuromasts are situated in epidermal pits.

Distribution. Endemic to Lake Baikal: it inhabits the sandy-muddy and muddy bottom, at depths from 30-50 to 400 m.

Examined material: 40 specimens

References: (Gratzianov 1902; Taliev, 1955; Bogdanov, 2021).

Subgenus *Korotnevia* Bogdanov, subgenus novum

Fem.; type species: *Abyssocottus gibbosus* Berg 1906.

Description (Fig.1). The head is moderately flattened. The suborbital and frontal bones form moderately developed crests. There is one small blunted spine on the preoperculum. The eyes are small, round, in large oval orbits. There are no bone spicules on the body. The neuromasts are situated in epidermal pits or on the papillae (as an exception in *A. elochini*).

Etymology. The taxon is named after Professor A.A. Korotnev, the founder of the study of the deep-water ichthyofauna of Lake Baikal.

***Abyssocottus (Korotnevia) elochini* Taliev, 1955 – Elokhin sculpin**

Abyssocottus elochini Taliev, 1955: 347, 350, 351 syntypes (3), Lake Baikal, northern part, Yelokhin Cape, depth 250-300 m. One of the syntypes: ZISP 46661, whereabouts of others is unknown.

Description. Length (TL) reaches to 77 mm. Coloration of top is brown with dark spots or light brown with light spots, bottom is white; D_1 4-5; D_2 14-15; P 17-18; *V* I,3; *A* 12-13; *sp.br.* 5-6, *l.so.* 10, *l.io.* 17, *l.t.* 5, *l.oc.* 2, *l.pm.* 16, *l.l.* 30-33.

Distribution. Local endemic of Northern Baikal inhabits the stony bottom at a depth of more than 250 m.

References: (Berg, 1907; Taliev, 1955; Sideleva, 2003).

***Abyssocottus (Korotnevia) gibbosus* Berg, 1906 – Hump-back [White] sculpin**

Abyssocottus gibbosus Berg, 1906: 908. Lectotype ZISP 13737 designated by Berg (1907: 44, Taf. III, fig 2c); Northern Baikal, opposite Goremyki (now Baikalskoye) village, depth 625 m. Paralectotypes (4) collections No 6 and 31 by prof. A. Korotnev [Korotneff] probably at ZM KNU.

Description. Length (TL) reaches 140 mm, weight is up to 50 g. Coloration is monotone light brown, grey or white; D_1 5-7; D_2 14-16; P 16-18; *V* I,3; *A* 11-14; *sp.br.* 4-6, *l.so.* 10-12, *l.io.* 15-18, *l.t.* 4-6, *l.oc.* 1-3 *l.pm.* 21-25, *l.l.* 36-46.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 150 to 1600 m.

Examined material: 1 specimen.

References: (Berg, 1906, 1907; Taliev, 1955).

***Abyssocottus (Korotnevia) subulatus* Dybowski, 1908 – Fusiform sculpin**

Abyssocottus gibbosus var. *subulatus* Dybowski, 1908: 552; fig. 12; this taxon based on an illustration from (Berg, 1907: Taf. III, fig 2a). Holotype by monotypy: collection No 31 by prof. A. Korotnev [Korotneff] probably at ZM KNU; Lake Baikal.

Description. Length (TL) reaches 140 mm, weight is up to 50 g. Coloration is light brown with light spots; D_1 5–6; D_2 15–16; P 16–18; *V* I,3; *A* 13; *sp.br.* 5, *l.so.* 11–14, *l.io.* 15–17, *l.t.* 4–7, *l.oc.* 2–3, *l.pm.* 22–25, *l.l.* 37–40.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 400 to 600 м.

Examined material: 3 specimens.

References: (Berg, 1907; Dybowski, 1908; Bogdanov, 2013).

Subgenus *Limnocottus* Berg, 1906

Limnocottus Berg, 1906: 909 Masc.; type species: *Cottus godlewskii* Dybowski 1874, by subsequent designation (Berg, 1916: 446).

Description. The head is strongly flattened. The crests on the suborbital and frontal bones are poorly developed. There is one small sharp spine on the preoperculum. The eyes are round or oval, of medium or big size. There are bony spicules only under the pectoral fins. The neuromasts are situated in epidermal pits or on the short papillae in the anterior part of the suborbital line (as an exception in *A. godlewskii*).

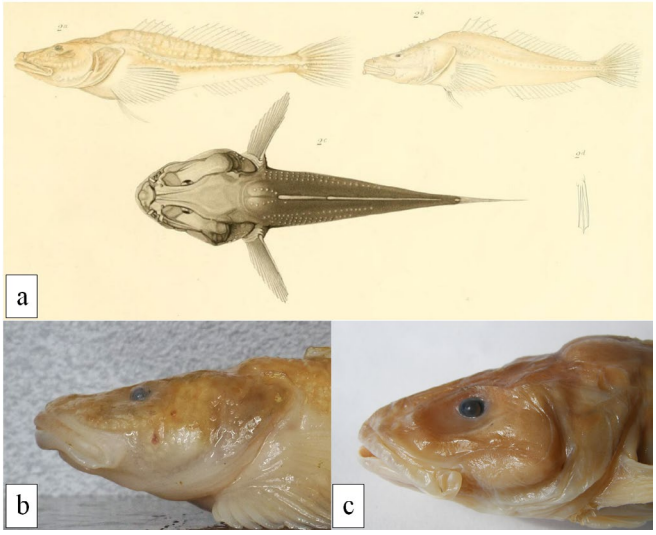

Fig.1. Species of subgenus *Korotnevia*. **a**) A fragment of a color plate from "Die Cataphracti des Baikal-Sees…" (Berg 1907: Taf. III, fig. 2), illustrating type and variability *Abyssocottus gibbosus* (sensu Berg); top: the paralectotypes of *Abyssocottus gibbosus,* the same specimens: the holotype *Abyssocottus gibbosus* var. *subulatus* Dybowski, 1908 (in left) and the earliest image of *Abyssocottus elochini* Taliev, 1955 (in right); bottom: lectotype *Abyssocottus gibbosus* ZISP 13737 in the dorsal projection and its ventral fin; **b**) head of *A. subulatus*, lateral view; **c**) head of *A. gibbosus*, lateral view.

***Abyssocottus (Limnocottus) bergi* (Dybowski, 1908) – Berg's sculpin**

Limnocottus godlewskii var. *bergi* Dybowski, 1908: 554, 555, fig. 15. This taxon based on an illustration in (Berg, 1907: Taf. II, fig. 4). Holotype by monotypy: collection No 15 by prof. A. Korotnev [Korotneff] probably at ZM KNU; northern part of Lake Baikal, depth 525 m.

Description. Length (TL) reaches 230 mm, weight is up to 170 g. Coloration monotone, top is of various shades of brown or grey-purple, bottom is white; D_1 4-6; D_2 11-14; P 14-15; *V* I,3; *A* 9-10; *sp.br.* 5-8, *l.so.* 18-27, *l.io.* 30-40, *l.t.* 4-11, *l.oc.* 1-5, *l.pm.* 28-38, *l.l.* 77-100.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 100 to 1200 m.

Examined material: 21 specimens.

References: (Berg, 1907; Dybowski, 1908; Bogdanov, 2017b).

***Abyssocottus (Limnocottus) bergianus* (Taliev, 1935) – Flat sculpin**

Limnocottus bergianus Taliev, 1935: 61, fig. 2. Syntypes (2) whereabouts is unknown; Lake Baikal: Listvenichny Bay, depth. 700 m; Barguzinsky Bay, depth. 619 m. The fixations specimen ZISP 32562 as the lectotype by Sideleva (2003: 196) is invalid, since these specimen were not syntypes, because the diagnoses, body size, sex and sampling locality of syntypes and "lectotype" do not coincide.

Description. Length (TL) reaches 220 mm, weight is up to 140 g. Coloration monotone, top is of various

shades of brown or grey-purple, bottom is white; D_1 3-5; D_2 12-14; P 14-15; *V* I,3; *A* 9-11; *sp.br.* 6-9, *l.so.* 12-20, *l.io.* 23-33, *l.t.* 3-7, *l.oc.* 1-3, *l.pm.* 16-27, *l.l.* (37) 42-63.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 100 to 1100 m.

Examined material: 24 specimens.

References: (Taliev, 1935; Sideleva, 2003; Bogdanov, 2017b).

***Abyssocottus (Limnocottus) godlewskii* (Dybowski, 1874) – Goglewski's sculpin**

Cottus godlewskii Dybowski, 1874: 385/ Holotype by monotypy (Dybowski, 1876: Pl. 4, fig. 2) whereabouts is unknown; Lake Baikal, southern part, near Kultuk village, depth 100-300 m.

Description. Length (TL) reaches 165 mm, weight is up to 45 g. Coloration monotone, top is of various shades of brown or grey-purple, bottom is white; D_1 2-5 (6); D_2 12-15; P 13-16; *V* I 3; *A* 8-11; *sp.br.* 6-8, *l.so.* 7-18, *l.io.* 24-34, *l.t.* 2-7, *l.oc.* 1-4, *l.pm.* 23-38, *l.l.* 38-53.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 100 to 900 m.

Examined material: 72 specimens

References: (Berg, 1906; Dybowski, 1874, 1876; Bogdanov, 2017b).

***Abyssocottus (Limnocottus) griseus* Taliev, 1955 – Dark spotted sculpin**

Abyssocottus godlewskii griseus Taliev, 1955: 85, fig. 29, 150, 151. Syntypes (20) whereabouts is unknown; Lake Baikal, southern part, Listvenichny Bay, Bol'shiye Koty Bay, depth. 160-700 m. Specimen ZISP 50804 established as a neotype by Sideleva (2003: 197) is invalid since it is conspecific to *L. godlewskii*. If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image (Taliev, 1955: fig. 150), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of the Code).

Description. Length (TL) reaches 100 mm, weight is up to 5 g. Coloration spotted, top is various shades of brown or grey-purple with dark spots, bottom is white; D_1 4-6; D_2 12-15; P 12-14; *V* I,3; *A* 9-12; *sp.br.* 5-8, *l.so.* 10-14, *l.io.* 17-24, *l.t.* 3-6, *l.oc.* 1-3, *l.pm.* 16-24, *l.l.* 12-42.

Distribution. Endemic to Lake Baikal: it inhabits the muddy and stony-muddy bottom at depths from 70 to 700 m.

Examined material: 25 specimens.

References: (Taliev, 1955; Sideleva, 2003; Bogdanov, 2017b).

***Abyssocottus (Limnocottus) pallidus* (Taliev, 1948) – Slender sculpin**

Limnocottus pallidus Taliev, 1948: 107, tabl. 2 Syntypes (20) whereabouts is unknown; Lake Baikal, southern part, Listvenichny Bay, depth 80-850 m. Specimen ZISP 13744 established as a neotype by Sideleva (2003: 198) is invalid, since it is designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code). If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image of syntype (Taliev, 1955: fig. 152), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of the Code).

Description. Length (TL) reaches 150 mm, weight is up to 15 g. Coloration monotone, top is of various shades of brown or grey-purple, bottom is white; D_1 3-6; D_2 11-14; P 13-15; *V* I,3; *A* 9-11; *sp.br.* 5-9, *l.so.* 12-21, *l.io.* 23-40, *l.t.* 3-9, *l.oc.* 1-4, *l.pm.* 16-30, *l.l.* 42-74.

Distribution. Endemic to Lake Baikal: it inhabits the muddy and sandy-muddy bottom at depths from 50 to 1100 m.

Examined material: 68 specimens

References: (Taliev, 1948, 1955; Sideleva, 2003; Bogdanov, 2017b).

Subgenus *Neocottus* Sideleva, 1982

Neocottus Sideleva, 1982: 31. Masc.; type species: *Abyssocottus werestschagini* Taliev 1935, by monotypy.

Description. The head is moderately flattened. The crests on the suborbital and frontal bones are well or moderately developed. The upper preopercular spine is well developed or rudimentary, the rudiments of two more spines may be located below. The eyes are small or medium in large deep orbits. There are no spicules on the body. Neuromasts are located on high papillae compressed from the sides.

***Abyssocottus (Neocottus) thermalis* (Sideleva, 2002) – Thermal sculpin**

Neocottus thermalis Sideleva, 2002: 220 [275]. Holotype ZISP 52169; paratypes ZISP 52197 (4); Lake Baikal, northern part, Frolikha bay, depth 450-480 m.

Description. Length (TL) reaches 160 mm. Coloration monotone, top is grey, bottom is white; D_1 6-7; D_2 15-17; P 16-17; *V* I,3; *A* 11-13; *sp.br.* 6-7, *l.so.* 7, *l.io.* 14, *l.t.* 5, *l.oc.* 1-3, *l.pm.* 18, *l.l.* 31-35.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths more than 400 m

Examined material: 8 specimens

References: (Sideleva, 2002).

***Abyssocottus (Neocottus) werestschagini* Taliev, 1935 – Vereshchagin's sculpin**

Abyssocottus werestschagini Taliev, 1935: 63, fig. 3. Syntypes (5) whereabouts is unknown; Lake Baikal, southern part, depth 800-1200 m. Specimen ZISP 46662 established as a neotype by Sideleva (2003: 200) is invalid, since it is designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code). If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image (Taliev, 1935: fig 3), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of the Code).

Description. Length (TL) reaches 100 mm. Coloration monotone, top is light grey, bottom is white; D_1 6-8; D_2 15-18; P 16-17; *V* I,3; *A* 11-13; *sp.br.* 6-8, *l.so.* 7-9, *l.io.* 13-16, *l.t.* 2-4, *l.oc.* 1-2, *l.pm.* 15-17, *l.l.* 31-37.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 800 to 1400 m

Examined material: 2 specimens

References: (Taliev, 1935, 1955; Sideleva, 1982, 2003).

Genus *Adipocottus* Bogdanov genus novum – Fatty sculpins

Type species: *Cottus nikolskii* Berg, 1901

Description (Fig.2). There are spicules on the body only under the pectoral fins. There are three spines or their rudiments on the preoperculum. The skin canaliculi are completely reduced. The sensory canals open outward with wide pores representing holes in the membrane of fountanels. Its diameter is close to the size of the fontanels. The supraorbital canal opens with three pores in the pre-coronary part. There are two pores on the chin.

Etymology: the name *Adipocottus* is derived from the Latin words *adiposus* means fatty and *cottus* means sculpin. It is a translation into Latin “Fatty sculpin” the common name of type species of this genus.

***Adipocottus multiradiatus* (Berg, 1907) – Spotty-fins sculpin**

Batrachocottus nikolskii var. *multiradiatus* Berg, 1907: 52, pl. 2, fig. 2. Lectotype ZISP 13750, designated by Sideleva (2003: 156, fig 13.7, 13.8). paralectotypes ZISP 13751, 13752, 52092; Lake Baikal, northern part, depth 525-900 m

Description. Length (TL) reaches 175 mm, weight is up to 105 g. Coloration light brown or olive with dark and light spots; D_1 6-8, D_2 16-19; *P* 16-20; *V* I,3; *A* 13-16; *sp.br.* 5-9; *l.l.* 9-14.

Distribution. Endemic to Lake Baikal: it inhabits the stony and stony-muddy bottom at depths from 15-20 to 900 m.

Examined material: 42 specimens

References: (Berg, 1907; Sideleva, 2003; Bogdanov, 2017a).

***Adipocottus nikolskii* (Berg, 1901) - Fatty sculpin**

Cottus nikolskii Berg, 1900: 346; Tab. VIII, fig. 1, 2 (published in 1901). Holotype by monotypy ZISP 11676; Lake Baikal, Selenginskoye shoal, depth 180-240 м.

Description. Length (TL) reaches 270 mm, weight is up to 280 g. Coloration light brown or olive with dark and light spots, or monotone brown, grey or pinky-grey; D_1 5-8, D_2 13-17; *P* 15-17; *V* I, 3; *A* 11-13; *sp.br.* 7-10; *l.l.* 9-13.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 200 to 1400 m.

Examined material: 26 specimens

References: (Berg, 1900; Bogdanov, 2017a).

***Adipocottus talievi* (Sideleva, 1999) – Taliev’s sculpin**

Batrachocottus talievi Sideleva, 1999: 204 [150], fig. 1-3, tabl. 2, 3. Holotype ZISP 51524, paratypes (5) ZISP 51525; Lake Baikal, Maloye More Strait, depth 350-370 m (Sideleva, 1999).

Description. Length (TL) reaches 225 mm, weight is up to 150 g. Coloration light brown or olive with dark and light spots, or monotone light brown, grey or pinky-grey; D_1 6-8, D_2 14-18; *P* 15-20; *V* I,3; *A* 11-14; *sp.br.* 5-8; *l.l.* 9-20.

Distribution. Endemic to Lake Baikal: it inhabits the muddy bottom at depths from 100 до 1300 m.

Examined material: 108 specimens

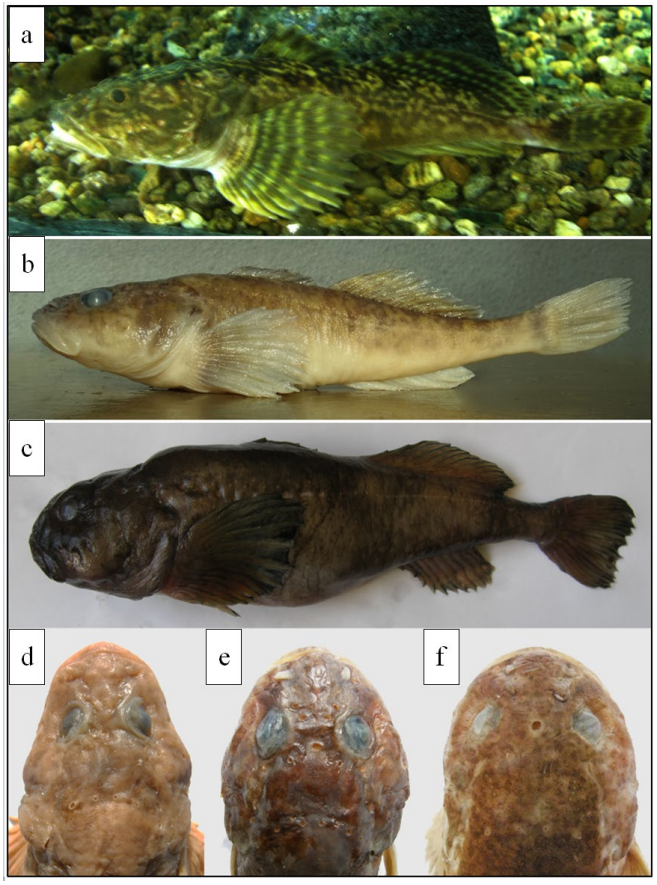

Fig.2. The species of genus *Adipocottus*. The lateral view of *A. multiradiatus* (a), *A. talievi* (b), *A. nikolskii* (c) and shape of the head in dorsal projection: *A. multiradiatus* (d), *A. talievi* (e), *A. nikolskii* (f).

References: (Sideleva, 1999; Bogdanov, 2017a).

Genus *Batrachocottus* Berg, 1903 – Big-head sculpins

Batrachocottus Berg, 1903: 108. Masc.; type species: *Cottus baicalensis* Dybowski 1874, by monotypy.

Description. Head is moderately flattened without protruding knobs and crests. There is one spine on the preoperculum. Bony spicules there are only under the pectoral fins. The fontanels of the sensory canals open outward with through a short skin canaliculus with a terminal pore. The pores are large. The supraorbital canal opens with three pores in the pre-coronary part. There are two pores on the chin.

***Batrachocottus baicalensis* (Dybowski, 1874) – Big-head sculpin**

Cottus baicalensis Dybowski, 1874: 386. Lectotype and paralectotypes ZMB 7810(1+3); lectotype designated by Dybowski (1908: 550, rys. 7) by image from (Dybowski, 1876: Tabl. III, fig. 2); Lake Baikal.

Batrachocottus baicalensis pachytus Taliev, 1955: 262, fig. 104. Holotype by monotypy is lost; Lake Baikal, southern part, Bol’shiye Koty bay, depth 180-220 m.

Batrachocottus uschkani Taliev, 1955: 263, fig. 56, 105. Syntypes (18) whereabouts is unknown; Lake Baikal, northern part, Ushkanii islands, depth 10-14 m.

Description. Length (TL) reaches 190 mm, weight is up to 160 g. Coloration brown, green-brown or red-brown with dark spots; D_1 5-8, D_2 14-18; *P* 14-17; *V* I,3; *A* 9-13; *sp.br.* 4-7; *l.l.* 9-18.

Distribution. Endemic to Lake Baikal: it inhabits the stony and stony-muddy bottom at depths from 1 to 180 m, Outside Baikal is found in the upper part of the Irkutsk Reservoir.

Examined material: 184 specimens

References: (Dybowski, 1874, 1876, 1908; Berg, 1903; Taliev, 1955; Bogdanov, 2017a).

Genus *Procottus* Gratzianow, 1902 – Red sculpins

Procottus Gratzianov, 1902: 27, Masc.; type species: *Cottus jeittelesii* Dybowski 1874, by monotypy.

Description. The head without protruding knobs, crests and spines. The skin is naked. The sensory system is represented by free neuromasts grouped in lines that replicate the topography of sensory canals. Neuromasts are located in the epidermal pits.

***Procottus bicolor* Dybowski, 1908 – Bicolor [Red] sculpin**

Procottus jeittelesii var. *bicolor* Dybowski, 1908: 556, rys. 18. Holotype by monotypy: collection No52 by prof. A. Korotnev [Korotneff] probably at ZM KNU; Baikal, opposite Utulik village, depth 850 m.

Description. Length (TL) reaches 140 mm, weight is up to 40 g. The coloration can be of various shades of red, red-brown or purple with numerous light and dark spots; D_1 6-9; D_2 18-21; P 16-19; *V* I,3; *A* 13-16; *sp.br.* 4-8, *l.so.* 13-23, *l.io.* 18-29, *l.t.* 7-15, *l.oc.* 3-8, *l.pm.* 20-30, *l.l.* 59-90.

Distribution. Endemic to Lake Baikal: it inhabits the muddy and stony-muddy bottom at depths from 50 to 900 m.

Examined material: 56 specimens.

References: (Berg, 1907; Dybowski, 1908).

***Procottus gotoi* Sideleva, 2001 – Goto's sculpin**

Procottus gotoi Sideleva, 2001: 69, fig. 2, tabl. 3. Holotype ZISP 52083, paratypes ZISP 52084 (1), ZISP 52085 (2); Lake Baikal, southern part, Bol'shiye Koty Bay, depth 10 m

Description. Length (TL) reaches 150 mm, weight is up to 85 g. The coloration deep green or olive, monotone or with dark spots forming vertical stripes; D_1 6-9; D_2 18-21; P 16-19; *V* I,3; *A* 13-16; *sp.br.* 4-8, *l.so.* 13-23, *l.io.* 18-29, *l.t.* 7-15, *l.oc.* 3-8, *l.pm.* 20-30, *l.l.* 58-82.

Distribution. Endemic to Lake Baikal: it inhabits the stony and stony-muddy bottom at depths from 1 to 150 m.

Examined material: 31 specimens.

References: (Sideleva, 2001).

***Procottus gurwicii* (Taliev, 1946) Dwarf [red] sculpin**

Metacottus gurwičii Taliev, 1946: 90, fig. 1-5. Holotype by monotypy ZISP 46660; Lake Baikal, in the southern part near of Marituy village, depth. 93 m

Description. Length (TL) reaches 80 mm, weight is up to 8 g. The coloration can be of various shades of red, red-brown, purple or olive with numerous light and dark spots; D_1 7; D_2 18-20; P 16-19; *V* I,3; *A* 13-15; *sp.br.* 6-7, *l.so.* 17-19, *l.io.* 18-26, *l.t.* 7-10, *l.oc.* 3-5, *l.pm.* 17-27, *l.l.* 37-58.

Distribution. Endemic to Lake Baikal: it inhabits the stony and stony-muddy bottom at depths from 5 to 100 m.

Examined material: 4 specimens

References: (Taliev, 1946b, 1955).

***Procottus jeittelesii* (Dybowski, 1874) – Jeitteles's [Red] sculpin**

Cottus jeittelesii Dybowski, 1874: 386; [in. The translated version of the article in German contains a link to the drawing in the original article in Russian, although it was published earlier than the original.] Lectotype: ZMB 7946 designated by Dybowski (1908: 557, rys. 17) by image from (Dybowski, 1876: Tabl. I, fig. 5); paralectotype (?) ZISP 3240Lake Baikal, southern part, depth 100 m.

Description. Length (TL) reaches 175 mm, weight is up to 115 g. The coloration can be of various shades of red, red-brown or purple with numerous light and dark spots; D_1 6-9; D_2 17-21; P 16-18; *V* I,3; *A* 13-15; *sp.br.* 6-9, *l.so.* 19-32, *l.io.* 25-40, *l.t.* 11-18, *l.oc.* 4-10, *l.pm.* 26-41, *l.l.* 82-117.

Distribution. Endemic to Lake Baikal: it inhabits the muddy and stony-muddy bottom at depths from 50 to 900 m.

Examined material: 43 specimens

References: (Dybowski, 1874, 1876, 1908).

***Procottus major* Taliev, 1949 – Big red sculpin**

Procottus jeittelesi major Taliev in Berg, 1949: 1169. Syntypes not designated; Lake Baikal. Specimen ZISP 52082 established as a neotype by Sideleva (2003: 208) is invalid, since it is designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code). If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image (Taliev, 1955: fig. 123), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of the Code).

Description. Length (TL) reaches 270 mm, weight is up to 370 g. The coloration can be of various shades of red, red-brown or purple with light spots forming vertical stripes; D_1 7-9; D_2 18-22; P 16-19; *V* I,3; *A* 13-17; *sp.br.* 5-7, *l.so.* 20-34, *l.io.* 29-40, *l.t.* 11-19, *l.oc.* 6-12, *l.pm.* 30-48, *l.l.* 100-131.

Distribution. Endemic to Lake Baikal: it inhabits the muddy and stony-muddy bottom at depths from 50 to 900 m.

Examined material: 39 specimens.

References: (Berg,1949; Taliev, 1955; Sideleva, 2003)

***Procottus minor* Taliev, 1946 – Little red sculpin**

Procottus jeittelesi minor Taliev, 1946: 91 Syntypes (12) whereabouts is unknown; Lake Baikal, southern part, Listvenichny Bay, depth 60-200 m. If there is an objective need to designate a single name-bearing type of the species, then the lectotype may be designated from the image (Taliev, 1955: fig. 122), the fact that this specimen no longer exists or cannot be traced does not of itself invalidate the designation (article 74.4 of

the Code).

Description. Length (TL) reaches 75 mm, weight is up to 4.5-5 g. The coloration can be of various shades of red or olive with numerous light and dark spots; D_1 7; D_2 19-20; P 16-19; *V* I,3; *A* 13-15; *sp.br.* 6-7, *l.so.* 17-18, *l.io.* 18-20, *l.t.* 7-8, *l.oc.* 3-5, *l.pm.* 24-25, *l.l.* 37-47.

Distribution. Endemic to Lake Baikal: it inhabits the stony and stony-muddy bottom at depths from 5 to 350 m.

Examined material: 8 specimens

References: (Taliev, 1946, 1955)

Tribe Comephorini Bonaparte, 1850 – Baikal oil fishes

Comephorini Bonaparte, 1850: tab. 1. *Comephorus* La Cepède, 1800 type by monotypy

Genus *Comephorus* LaCepede, 1800 – Baikal oil fishes, Golomyanka

Comephorus La Cepède, 1800: 48. Masc. *Callionimus baïkalensis* Pallas, 1776. Type by monotypy.

Description. The head is pike–shaped, without protruding knobs, crests and spines. There are no ventral fins. There are no bone spicules on the body. The organs of the sensory system have the appearance of extensive cavities, which are hypertrophied fontanelles of sensory canals, delimited by thin bone bridges, and tightened by a connective tissue membrane with large pores. The supraorbital canal in the pre-coronary region opens in three pores. There is one pore on the chin.

***Comephorus baikalensis* (Pallas, 1776) – Big golomyanka**

Callionimus baïkalensis Pallas, 1776: 290, 707. Syntypes not designated; Lake Baikal. Specimen ZISP 16321 established as a neotype by Sideleva (2003: 171) is invalid, since it is designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code).

Description. The females reach a length (TL) up to 210 mm and a weight up to 70 g, the males reach up to 130-140 mm and 15 g. Coloration of top is grey, bottom is white; D_1 7-8; D_2 30-34; *A* 30-36; *P* 11-15; *sp.br.* 12-16; *l.l.* 24-35.

Distribution. Endemic to Lake Baikal: it inhabits the open water area of the lake from the surface to maximum depths.

References: (Pallas, 1776; La Cepède, 1800; Bonaparte, 1850; Taliev, 1955; Sideleva, 2003; Anoshko and Makarov, 2022).

***Comephorus dybowski* Korotneff, 1905 – Little golomyanka**

Comephorus Dybowski Korotneff, 1905: 12, rys. 2, 3; Taf. I fig. 2, 3. Syntypes (11) whereabouts is unknown; Lake Baikal.

Description. Length (TL) reaches 130-140 mm, weight is up to 12-15 g. Skin is colorless; D_1 8-9; $D_1$31-34; *A* 32-36; *P* 13-15; *sp.br.* 24-28; *l.l.* 12-17.

Distribution. Endemic to Lake Baikal: it inhabits the open water area of the lake from the surface to maximum depths.

References: (Korotneff, 1905; Taliev, 1955; Anoshko and Makarov, 2022; Sideleva, 2003).

Tribe Cottini Bonaparte, 1831 – Common Sculpins

Cottini Bonaparte: 1831: 90, 103; type: *Cottus* Linnaeus, 1758 type by original designation.

According to the molecular data (Kinziger et al., 2005; Shedko and Miroshnichenko, 2007; Yokoyama et al., 2008; Goto et al., 2020), the tribe includes seven genera of freshwater sculpins: *Cottus* Linnaeus, 1758; *Cephalocottus* Gratzianov, 1907; *Cottopsis* Girard, 1850; *Mesocottus* Gratzianov, 1907; *Paracottus* Taliev, 1949; *Uranidea* DeKay, 1842 and new genus *Alpinocottus* (for two species: *A. poecilopus* and *A. volki*). Their distinctive features are four soft rays in the ventral fin and 9-16 rays in the anal fin.

Genus *Alpinocottus* gen. nov. – Alpine sculpins

Masc. Type species: *Cottus poecilopus* Heckel, 1840

Description (Fig.3). The head is moderately flattened, with a short and high snout, without protruding knobs and crests. The preopercular spine is small, hidden in the skin, sometimes there are 1-2 rudimentary spines under it. The ventral fins have one spiny and four soft rays. The fourth ray is shortened (no more than half the length of the fin), or rudimentary. There are spicules on the body only under the pectoral fins. The fontanels of the sensory canals open outward with through a short and narrow skin canaliculus with a terminal pore. The pores are small. The supraorbital canal opens with three pores in the pre-coronary part. There are two pores on the chin.

Etymology: the name *Alpinocottus* is derived from the Latin words *alpinus* means alpine, mountain and *cottus* means sculpin. It is a translation into Latin "Alpine sculpin" the common name of type species of this genus.

Systematics note: The genus includes two species *A. poecilopus* (Heckel, 1840) and *A. volki* (Taranetz, 1933). Volk's sculpin, *A. volki* is distributed only in

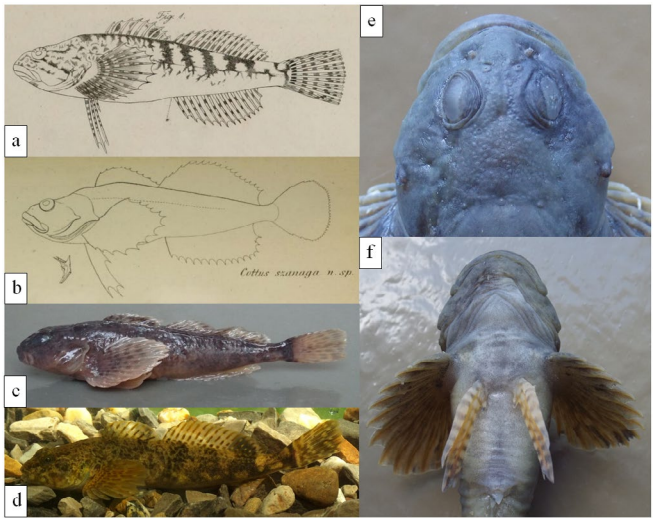

Fig.3. The *Alpinocottus poecilopus* (Heckel, 1840) and *A. poecilopus szanaga* (Dybowski, 1869): a) the syntype of *Cottus poecilopus* (by Heckel, 1840); b) the syntype of *Cottus szanaga* (by Dybowski, 1869); c) formaldehyde fixed specimen of *A. poecilopus szanaga* from Verkhnekicherskoye lake, Baikal basin; d) live specimen of *A. poecilopus szanaga* from Ilikta river, Lena basin; e) the head in dorsal projection; f) ventral projection of the anterior part of the body showing the shape of the ventral fins and urogenital papilla.

the basin of the Japanese sea in the southern part of Russian Far East from the Velikaya Kema River to the Partizanskaya River (Shedko and Miroshnichenko, 2007). Alpin sculpin, *A. poecilopus* is a widespread (from Chukotka and Sakhalin in the east to Scandinavia and the Carpathians in the west) polytypical species, geographical isolates of which it is advisable to consider in the rank of subspecies (Bogdanov et al., 2013). One of them, *A. poecilopus szanaga* inhabits Baikal Region.

Alpinocottus poecilopus **(Heckel, 1840) – Alpine sculpin**

Cottus poecilopus Heckel 1836 [1840]:145, Pl. 8 (figs. 1-2) Syntypes: NMW 6424 (1), 6729 (3), 78816 (2); mountain brooks near town Kežmarok in Slovakia, the Vistula river basin (Kottelat, 1997).

Alpinocottus poecilopus szanaga **(Dybowski, 1869) – East Siberian alpine sculpin**

Cottus szanaga Dybowski 1869: 949, Pl. 14 (fig. 1) Syntype: ZMB 7107 (1). Onon River and its tributaries, Amur River basin, Russia.

Cottus kuznetzovi Berg, 1903:110 holotype ZISP 12476 (probably lost), the Aunakit brook in the Olyokma river basin; Specimen ZISP 53969 selected as a neotype (Сиделева и Гото, 2009) is invalid, since it is designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code).

Description. The maximum length (TL) and weight varies from 80 to 140 mm (usually 120-125 mm) and from 3.5 to 25 g in different populations. The coloration is gray, light brown or olive with numerous dark and light spots forming transverse bands of irregular outlines. D_1 7-10; D_2 16-20; P 13-16; V I,4; A 12-16; sp. br. 3-7; l.l. 21-24.

Distribution. The range area includes the Amur and Lena basins and Arctic rivers from the Putorana Plateau to the lower reaches of the Kolyma. In Baikal region, it inhabits the Lena basin almost everywhere. In Baikal basin, it inhabits the tributaries of the Verkhnyaya Angara.

Examined material: 288 specimens.

References: (Heckel, 1840; Dybowski, 1869; Berg, 1903; Kottelat, 1997; Sideleva and Goto, 2009; Bogdanov et al., 2013; Andreev et al., 2020).

Genus *Cottus* Linnaeus 1758 – Common sculpins

Cottus Linnaeus 1758: 264 Masc. type *Cottus gobio* Linnaeus 1758. by subsequent designation.

Description. The head is moderately flattened without protruding knobs and crests. The preopercular spine is large, sharp, sickle-shaped curved, sometimes there are 1-2 rudimentary spines under it. The ventral fins have one spiny and four soft rays. Bony spicules, or their rudiments, cover the entire upper part of the body, or there are only under the pectoral fins. The fontanels of the sensory canals open outward with through a short and narrow skin canaliculus with a terminal pore. The pores are small. The supraorbital canal opens with two pores in the pre-coronary part. There is one pore on the chin.

Cottus sibiricus **Warpachowski, 1889 – Siberian sculpin**

Cottus sibiricus Warpachowski, 1889:12; lectotype: ZISP 6328; paralectotypes: ZISP 6208 (1), ZISP 6330 (1), ZISP 56235 (1) (Sideleva, 2017); the Yenisei River near Minusinsk Town.

Description. The length (TL) reaches 160 mm (usually 120-150 mm), weight up to 40-60 g. The coloration is reddish-brown or yellowish-gray with numerous spots forming vertical stripes. There are numerous bone spicules on the back and sides. D_1 6-10; D_2 15-20; *P* 14-17; *V* I,4; *A* 11-15; *sp. br.* 4-7; *l.l.* 33-40.

Distribution. The range area is mosaic from the Irtysh to the Yana. In Baikal region, it inhabits the Lena, Kirenga, Vitim, Irkut, Kitoy and Belaya, less often their tributaries.

Examined material: 168 specimens.

References: (Warpachowski, 1889; Bogdanov and Knizhin, 2007; Sideleva, 2017)

Genus *Paracottus* Taliev, 1955 – Stone sculpins

Paracottus Taliev, 1955: 234. Masc.; type *Cottus knerii* Dybowski 1874, by original designation.

Description. Head is moderately flattened without protruding knobs and crests. There are 1-3 small or rudimentary spines on the preoperculum. The ventral fins have one spiny and four soft rays. Bony spicules are located only under the pectoral fins. The fontanels of the sensory canals open outward with through a short and narrow skin canaliculus with a terminal pore. The pores are small. The supraorbital canal opens with three pores in the pre-coronary part. There are two pores on the chin.

Paracottus knerii **(Dybowski, 1874) – Stone sculpin**

Cottus knerii Dybowski, 1874: 385. Lectotype: ZMB 7809, designated by Dybowski (1908: 546, rys. 1) by images from (Dybowski, 1876: Tabl. I, fig. 4); Lake Baikal, near Kultuk village.

Cottus knerii var. *nudus* Dybowski, 1908: 546; Syntypes not designated; Lake Baikal.

Paracottus (Paracottus) insularis Taliev, 1955: 241. fig. 2, 92. Syntypes (14) whereabouts is unknown; Lake Baikal, Ushkan'i islands.

Paracottus (Paracottus) kneri putorania Koryakov et Sidelyov, 1976: 555. Syntypes (16) whereabouts is unknown; Lake Verkhnyaya Agata, Putorana Plateau.

Description. The maximum length (TL) and weight varies from 80 to 140 mm and from 1.5-2 to 46.6 g in different populations. Coloration is of various shades of brown or grey-olive with dark spots; D_1 6-9; D_2 15-20; A 12-16; P 14-18; *V* I,4; *sp.br.* 4-7; *l.l.* 6-18.

Distribution. The range area includes the coastal zone of Lake Baikal from the edge to 110 m, the Angara and Yenisei Rivers, as well as their tributaries and mountain lakes of their basins. It inhabits the stony bottom.

Examined material: 405 specimens.

References: (Dybowski, 1874, 1876, 1908; Taliev, 1955; Koryakov and Sidelev, 1976; Bogdanov, 2007).

Tribe Cottocomephorini Berg, 1906 – Baikal long-fins sculpins

Cottocomephoridae Berg, 1906: 30, 32. *Cottocomephorus* Pellegrin, 1900 type by monotypy

The tribe includes two genera of benthopelagic

sculpins *Cottocomephorus* Pellegrin, 1900 and *Leocottus* Taliev, 1955. Their distinctive features are four soft rays in the ventral fin and 18-23 rays in the anal fin.

Genus *Cottocomephorus* Pellegrin, 1900 – Baikal long-fins sculpins

Cottocomephorus Pellegrin, 1900: 354. Masc.; type species: *Cottocomephorus megalops* Pellegrin 1900, by monotypy.

Description. Head without protruding knobs and crests. There are 1-5 well-developed or rudimentary spines on the preoperculum. The ventral fins have one spiny and four soft rays. Bony spicules are located only under the pectoral fins. The fontanels of the sensory canals open outward with through a short and narrow skin canaliculus with a terminal pore. The pores are small. The supraorbital canal opens with two pores in the pre-coronary part. There are two pores on the chin.

***Cottocomephorus comephoroides* (Berg, 1901) Small-eyed long-fins sculpin**

Cottus comephoroides Berg, 1900: 338, Tabl. VIII fig. 3 (published in 1901). Syntypes ZISP 11531-35, BMNH 1905.12.4.18; Lake Baikal, Selenginskoye shoal.

Cottocomephorus grewingkii var. *siemenkiewiczii* Dybowski 1908: 559, fig. 20. Holotype by monotypy ZISP 13180; taxon description based on illustration (in Berg, 1907: Taf. III, fig. 1a); Baikal.

Description. Males reach the length (TL) up to 200 mm and a weight up to 100 g, females reach up to 170 mm and 50 g. Coloration of top is monotone light olive, sides are silver-pearl, bottom is white; males breeding color of body is black, pectoral fins are yellow with black stripes; D_1 7-9; D_2 16-20; P 18-21; A 20-23; *V* I,4; *sp.br.* 15-20; *l.l.* 15-23.

Distribution. Endemic to Lake Baikal: it inhabits the open water area of the lake from 50 to 500 m.

Examined material: 90 specimens.

References: (Begr, 1900, 1907; Dybowski 1908; Bogdanov, 2019).

***Cottocomephorus grewingkii* (Dybowski, 1874) Yellow-fins sculpin**

Cottus grewingkii Dybowski, 1874: 384. Lectotype: (?)BMNH 1897.7.5.4. designated by Dybowski (1908: 559, rys. 19) by images from (Dybowski, 1876: Tabl. I, fig. 1) paralectotypes (?)ZMB 7808.(8); Lake Baikal, southern part, near Kultuk village.

Cottocomephorus grewingki var. *alexandrae* Taliev, 1935: 64, fig. 4, tabl. 1. Syntypes (7) whereabouts is unknown; Lake Baikal, in the southern part near of Marituy village and between Tankhoy and Vydrino villages; in the northern part near Svyatoy Nos peninsula, depth 100-500 m.

Cottocomephorus grewingki alexandrae Taliev, 1955: 287 (rediscription). Syntypes (28) whereabouts is unknown; Lake Baikal, northern part, Kicherskaya bay).

Description. Males reach the length (TL) up to 145 mm and a weight up to 25 g, females reach up to 135 mm and 17.5 g. Coloration of body and fins is light olive with brown spots; males breeding color of body is black, pectoral fins are yellow with black stripes; D_1 7-10; D_2 16-21; P 17-21; A 19-22; *V* I,4; *sp.br.* 15-21; *l.l.* 10-17.

Distribution. Endemic to Lake Baikal: it inhabits the coastal zone from the water's edge to 300-450 m. Outside Baikal is found in the Angara River and the Angara reservoirs.

Examined material: 456 specimens.

References: (Dybowski, 1874, 1876; Taliev, 1935, 1955; Bogdanov, 2019).

***Cottocomephorus inermis* (Jakowlew, 1890) – Big-eyed long-fins sculpin**

Cottus inermis Yakovlev, 1890: 52. Holotype by monotypy (previously was located in NM RGS, Irkutsk (Taliev, 1955)) in present time is lost; the Angara River near Irkutsk. Specimen ZISP 6350 established as a neotype by Sideleva (2003: 166) is invalid, since it is designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code).

Cottocomephorus megalops Pellegrin, 1900: 354. Holotype by monotypy MNHN 1897-0590.; the Angara River near Irkutsk (Blanc and Hureau, 1968).

Description. Males reach the length (TL) up to 220 mm and a weight up to 210 g, females reach up to 190 mm and 65 g. Coloration of top is monotone light violet, sides are silver-pearl, bottom is white; males breeding color of body and pectoral fins is deep purple; D_1 7-9; D_2 17-21; P 19-22; A 20-23; *V* I,4; *sp.br.* 11-15; *l.l.* 15-23.

Distribution. Endemic to Lake Baikal: it inhabits the open water area of the lake from 50 to 500 m. Outside Baikal, sporadic cases of catching specimens of this species in the upper reaches of the Angara River are known, up to 300 km below the source.

Examined material: 53 specimens.

References: (Yakovlev, 1890; Pellegrin, 1900; Taliev, 1955; Blanc and Hureau, 1968; Sideleva, 2003; Bogdanov, 2019).

Genus *Leocottus* Palmer, 1961 – Sandy sculpins

Leocottus Taliev in Palmer and White, 1958 [1961]: 137. Masc.; as a subgenus of the genus *Paracottus;* type species: *Paracottus (Leocottus) pelagicus* Taliev 1955, by original designation.

Description. Head without protruding knobs and crests. There are 1-3 well-developed or rudimentary spines on the preoperculum. The ventral fins have one spiny and four soft rays. Bony spicules or their rudiments cover the entire upper part of the body, or they are located only under the pectoral fins. The fontanels of the sensory canals open outward with through a short and narrow skin canaliculus with a terminal pore. The pores are small. The supraorbital canal opens with two pores in the pre-coronary part. There are two pores on the chin.

***Leocottus kesslerii* (Dybowski, 1874) – Sandy sculpin**

Cottus kesslerii Dybowski, 1874: 384. Lectotype (?)BMNH 1897.7.5.5., designated by Dybowski (1908: 546, rys. 1) by image from (Dybowski, 1876: Tabl. I, fig. 3), paralectotypes (?) ZMB 7807 (4); Lake Baikal, southern part, near Kultuk village.

Cottus trigonocephalus Gratzianow, 1902: 32. Holotype by monotypy ZMMU P-3123; Lake Baikal, northern part, Ushkan'i islands.

Cottus kesslerii var. *nudus* Dybowski, 1908: 545. Syntypes are not designated; Lake Baikal.

Cottus kessleri bauntovi Taliev, 1946: 744, fig. 2. Syntypes (3) whereabouts is unknown; type locality is unknown.

Paracottus (Leocottus) kessleri lubricus Taliev, 1955: 250, fig. 97, 98. Syntypes (19) whereabouts is unknown; Lake Baikal, southern part.

Paracottus (Leocottus) pelagicus Taliev, 1955: 48, 252, fig. 99, 100. Syntypes (3) whereabouts is unknown; Lake Baikal, southern part.

Paracottus kessleri arachlensis Tarkhova, 1962: 103. Syntypes (100) whereabouts is unknown. Specimen ZISP 34220 established as a neotype by Sideleva (2003: 152) is invalid, since it is designated without specifying the exceptional necessity of this action (article 75.2, 75.3 of the Code). Arakhley lake in the Selenga river basin

Paracottus kessleri gussinensis Tarkhova, 1962: 108. Lectotype ZISP 52232, paralectotypes (9) ZISP 52233 designated by Sideleva (2003: 152); Gusinoye lake in the Selenga river basin.

Description. The maximum length (TL) and weight varies from 100 mm to 150 mm and from 10 to 40 g in different populations. Coloration is spotted, top is of various shades of brown or grey-olive with dark spots, bottom is white; D_1 6-9; D_2 17-22; P 17-20; *V* I,4; *A* 19-23; *sp.br.* 4-7, *l.l.* 17-45.

Distribution. The distribution area includes the coastal zone of Lake Baikal from the edge to 150-170 m; mountain lakes in Northern Baikal region; a basin of the lower and middle reaches of the Selenga River, the Angara River and the Angara reservoirs. It inhabits the sandy and stony-sandy bottom.

Examined material: 605 specimens.

References: (Dybowski, 1874, 1876; Gratzianow, 1902; Taliev, 1946a, 1955; Palmer and White, 1961; Tarkhova, 1962; Sideleva, 2003; Bogdanov, 2015).

5. Conclusion

Currently, 42 valid species belonging to ten genera and seven subgenera have been recorded in Lake Baikal and water systems of Baikal region:

Family Cottidae Bonaparte, 1831 – Sculpins
- Tribe Abyssocottini Berg, 1907 – Deep-water sculpins
  - Genus *Abyssocottus* Berg, 1906 – Deep-water sculpins
    - Subgenus *Abyssocottus* Berg, 1906
      - *A. fuscus* Bogdanov, 2014 – Brownish sculpin
      - *A. korotneffi* Berg, 1906 – Small-eyed sculpin
      - *A. pumilus* Bogdanov, 2014 – dwarf deep-water sculpin
    - Subgenus *Asprocottus* Berg, 1906
      - *A. abyssalis* (Taliev, 1955) – Deep-water rough sculpin
      - *A. herzensteini* (Berg, 1906) – Rough sculpin
      - *A. intermedius* (Taliev, 1955) – Half-naked sculpin
      - *A. korjakovi* (Sideleva, 2001) – Koryakov's sculpin
      - *A. parmiferus* (Taliev, 1955) – Armored sculpin
      - *A. platycephalus* (Taliev, 1955) – Flathead sculpin
      - *A. pulcher* (Taliev, 1955) – Sharp-snout sculpin
    - Subenus *Cottinella* Berg, 1907
      - *A. boulengeri* Berg, 1906 – Short-head sculpin
    - Subgenus *Cyphocottus* Sideleva, 2003
      - *A. eurystomus* (Taliev, 1955) – Broad-snout sculpin
      - *A. megalops* (Gratzianow, 1902) – Hump-back [Big-eyed] sculpin
    - Subgenus *Korotnevia* Bogdanov, subgenus novum
      - *A. elochini* Taliev, 1955 – Elokhin sculpin
      - *A. gibbosus* Berg, 1906 – Hump-back [White] sculpin
      - *A. subulatus* Dybowski, 1908 – Fusiform sculpin
    - Subgenus *Limnocottus* Berg, 1906
      - *A. bergi* (Dybowski, 1908) – Berg's sculpin
      - *A. bergianus* (Taliev, 1935) – Flat sculpin
      - *A. godlewskii* (Dybowski, 1874) – Goglewski's sculpin
      - *A. griseus* Taliev, 1955 – Dark spotted sculpin
      - *A. pallidus* (Taliev, 1948) – Slender sculpin
    - Subgenus *Neocottus* Sideleva, 1982
      - *A. thermalis* (Sideleva, 2002) – Thermal sculpin
      - *A. werestschagini* Taliev, 1935 – Vereshchagin's sculpin
    - Genus *Adipocottus* Bogdanov genus novum – Fatty sculpins
      - *A. multiradiatus* (Berg, 1907) – Spotty-fins sculpin
      - *A. nikolskii* (Berg, 1901) - Fatty sculpin
      - *A. talievi* (Sideleva, 1999) – Taliev's sculpin
    - Genus *Batrachocottus* Berg, 1903 – Big-head sculpins
      - *B. baicalensis* (Dybowski, 1874) – Big-head sculpin
    - Genus *Procottus* Gratzianow, 1902 – Red sculpins
      - *P. bicolor* Dybowski, 1908 – Bicolor [Red] sculpin
      - *P. gotoi* Sideleva, 2001 – Goto's sculpin
      - *P. gurwicii* (Taliev, 1946) Dwarf [red] sculpin
      - *P. jeittelesii* (Dybowski, 1874) – Jeitteles's [Red] sculpin
      - *P. major* Taliev, 1949 – Big red sculpin
      - *P. minor* Taliev, 1946 – Little red sculpin
- Tribe Comephorini Bonaparte, 1850 – Baikal oil fishes
  - Genus *Comephorus* LaCepede, 1800 – Baikal oil fishes, Golomyanka
    - *C. baikalensis* (Pallas, 1776) – Big golomyanka
    - *C. dybowski* Korotneff, 1905 – Little golomyanka
- Tribe Cottini Bonaparte, 1831 – Common Sculpins
  - Genus *Alpinocottus* gen. nov. – Alpine sculpins
    - *A. poecilopus szanaga* (Dybowski, 1869) – East Siberian alpine sculpin
  - Genus *Cottus* Linnaeus 1758 – Common sculpins
    - *C. sibiricus* Warpachowski, 1889 – Siberian sculpin
  - Genus *Paracottus* Taliev, 1955 – Stone sculpins
    - *P. knerii* (Dybowski, 1874) – Stone sculpin
- Tribe Cottocomephorini Berg, 1906 – Baikal long-fins sculpins
  - Genus *Cottocomephorus* Pellegrin, 1900 – Baikal long-fins sculpins
    - *C. comephoroides* (Berg, 1901) Small-eyed long-fins sculpin
    - *C. grewingkii* (Dybowski, 1874) Yellow-fins sculpin
    - *C. inermis* (Jakowlew, 1890) – Big-eyed long-fins sculpin
  - Genus *Leocottus* Palmer, 1961 – Sandy sculpins
    - *L. kesslerii* (Dybowski, 1874) – Sandy sculpin

The specified number of both species and genera cannot be considered final, and it will be adjusted as these fish are further studied.

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Conflict of Interest

The author declares no conflicts of interest.

References

Andreev R.S., Matveev A.N., Samusenok V.P. et al. 2020. Sculpin *Cottus* cf. *poecilopus* Heckel, 1837 in Baikal Lake Basin: First Findings. The Bulletin of Irkutsk State University. Series Biology. Ecology. 31: 30-51. (in Russian) DOI: 10.26516/2073-3372.2020.31.30

Anoshko P.N., Makarov M.M. 2022.Length-weight relationships of Baikal oilfish (Cottoidei: Comephorus). Limnology and Freshwater Biology. 6: 1720-1723. DOI: 10.31951/2658-3518-2022-A-6-1720

Berg L.S. 1900 [1901]. Ryby Bajkala [Fishes of Lake Baikal]. Ezhegodnik. Zoologicheskogo Muzeya Imperatorskoi Akademii Nauk [Annual of the Zoological Museum of the Imperial Academy of Sciences]. 5: 326-372. (in Russian). URL: https://archive.org/details/ezhegodnikzoolo190053impe/page/n101/mode/2up

Berg L.S. 1903. On the systematics of the Cottidae from Lake Baikal. Ezhegodnik. Zoologicheskogo Muzeya Imperatorskoi Akademii Nauk [Annual of the Zoological Museum of the Imperial Academy of Sciences]. 8: 99-114. (in Russian with English subtitle) URL: https://www.biodiversitylibrary.org/item/34427#page/167/mode/1up

Berg L.S. 1906. Übersicht der Cataphracti (Fam. Cottidae, Cottocomephoridae und Comephoridae) des Baikalsees [Overview of the Sculpins (Fam. Cottidae, Cottocomephoridae and Comephoridae) of Lake Baikal]. Zoologischer Anzeiger. 30. 906-911. URL: https://www.biodiversitylibrary.org/item/95538#page/922/mode/1up

Berg L.S. 1907. Die Cataphracti des Baikal-Sees (Fam. Cottidae, Cottocomephoridae und Comephoridae). [The Sculpins of Baikal Lake (Fam. Cottidae, Cottocomephoridae und Comephoridae).] Wissenschaftliche Ergebnisse einer Zoologischen Expedition nach dem Baikal-Sees unter Leitung des Professors Alexis Korotneff in der Jahren 1900-1902. Dritte Lieferung [Scientific results of a zoological expedition to Lake Baikal led by Professor Alex Korotneff in 1900-1902. Part 3] St. Petersburg und Berlin. URL: https://archive.org/details/wissenschaftlich03koro/page/42/mode/2up

Berg L.S. 1949. Ryby presnyh vod SSSR i sopredel'nyh stran [Freshwater fishes of the USSR and adjacent countries]. Moscow, Leningrad: Academy of Sciences USSR Publishing. Vol. 3: 927-1382. (in Russian)

Betancur-R R., Wiley E.O., Arratia G. et al. 2017. Phylogenetic classification of bony fishes. BMC Evolutionary Biology. 17(162): 1-40. DOI: 10.1186/s12862-017-0958-3

Blanc M., Hureau J.-C. 1968. Catalogue critique des types de poissons du Muséum national d'Histoire Naturelle. (Poissons a joues cuirassées). [Critical catalog of the types of fish of the National Museum of Natural History. (Sculpins)]. Publications diverses du Muséum National d'Histoire Naturelle [Various publications of the National Museum of Natural History]. 23: 1-71. (In Franch)

Bogdanov B.E. 2007. Variation of Stone Sculpin Paracottus knerii (Cottidae, Scorpaeniformes) of Baikal and Waters of Baikal Region. Journal of Ichthyology. 47 (2): 162-174.

Bogdanov B.E. 2013 [2014]. The description of two new species of fishes of the genus Abyssocottus Berg, 1906 (Scorpaeniformes: Cottidae). Baikalskij zoologiceskij zurnal [Baikal zoological journal]. 2 (13): 92-96. (In Russian with English abstract)

Bogdanov B.E. 2015. Variability and status of intraspecific forms of sand sculpin Leocottus kesslerii (Cottidae). Journal of Ichthyology. 55 (4): 454-463.

Bogdanov B.E. 2017a. Phenetic Relations and Problem of Species Identification of the Genus Batrachocottus (Pisces: Cottidae). Hydrobiological Journal. 53 (1): 41-49.

Bogdanov B.E. 2017b. Review of genus Limnocottus sculpins (Pisces: Cottidae): nomenclature, phenetic relationships and diagnostic characters. Baikalskij zoologiceskij zurnal [Baikal zoological journal]. 21 (2): 46-55. (In Russian with English abstract)

Bogdanov B.E. 2018. Phenetic relationships and diagnostic features of sculpins of the genus Asprocottus (Scorpaeniformes: Cottoidea). Limnology and Freshwater Biology. 2: 113-121. DOI: 10.31951/2658-3518-2018-A-2-113

Bogdanov B.E. 2019. Phenetic relationships and diagnostic features of sculpins of the genus Cottocomephorus (Perciformes: Cottidae). Limnology and Freshwater Biology. 2: 223-231. DOI: 10.31951/2658-3518-2019-A-2-223

Bogdanov B.E. 2021. Phenetic relationships and problem of specie identification of sculpins of the genus Cyphocottus (Pisces: Cottidae). Limnology and Freshwater Biology. 2: 1130-1136. DOI: 10.31951/2658-3518-2021-A-2-1130

Bogdanov B.E., Knizhin I.B. 2007. Variability of Siberian sculpin *Cottus sibiricus* (Cottidae, Sorpaeniformes). Journal of Ichthyology. 47 (4): 271-278. DOI: 10.1134/S0032945207040030

Bogdanov B.E., Sverdlova T.V., Knizhin I.B. 2013. Izmenchivost' i taksonomicheskii status sibirskikh populyatsii pestronogogo podkamenshchika Cottus poecilopus complex (Scorpaeniformes: Cottidae) [Variability and taxonomic status of siberian populations of Cottus poecilopus complex (Scorpaeniformes: Cottidae)]. Bulletin of Siberian Federal University. Biology. 6(1): 18-31. (in Russian)

Bogutskaya N.G., Naseka A.M. 2004. Catalogue of agnathans and fishes of fresh and brackish waters of Russia with comments on nomenclature and taxonomy. Moscow: KMK Publishing. (In Russian with English introduction)

Bonaparte C.L. 1831. Saggio di una distribuzione metodica degli animali vertebrati [Assay of a methodical distribution of vertebrate animals]. Roma: Presso Antonio Boulzaler. (in Italian) URL: https://www.biodiversitylibrary.org/item/103232#page/94/mode/1up

Bonaparte C.L. 1850. Conspectus systematis ichthyologiae. Editio reformata. [Conspectus of the ichthyology system. Reformed edition.] Batavia: E.J. Brill. (in Latin)

Dybowski B. 1869. Vorläufige Mittheilungen über die Fischfauna des Ononflusses und des Ingoda in Transbaikalien. [Preliminary information about the fish fauna of the Onon River and the Ingoda in Transbaikalia.] Verhandlungen der K.-K. zoologisch-botanischen Gesellschaft in Wien. [Proceedings of the Imperial and Royal Zoological and Botanical Society in Vienna.] 19: 945-958. Pls. 14-18. (in German) URL: https://www.biodiversitylibrary.org/item/137119#page/1083/mode/1up

Dybowski B. 1874. Die Fische des Baikal-Wassersystemes. [The fish of Baikal water system.] Verhandlungen der K.-K.

zoologisch-botanischen Gesellschaft in Wien. [Proceedings of the Imperial and Royal Zoological and Botanical Society in Vienna.] 24: 384-394. (in German) URL: https://www.biodiversitylibrary.org/page/30250413

Dybowski B. 1876. Ryby ozera Baykal [Fishes of Lake Baikal] Izvestiya Sibirskogo otdeleniya Imperatorskago russkago geograficheskago obshchestva [Proceedings of the Siberian branch of the Imperial Russian Geographical Society]. 7 (1/2): 1-25. (In Russian) URL: https://elib.rgo.ru/safe-view/123456789/213584/1/UnVQUkxJQjEyMDQ3MTYwLnBkZg

Dybowski B. 1908. O nowych badaniach nad fauna Bajkalu [New investigations of the fauna of Lake Baikal]. Kosmos. 33: 536-574. (in Polish with Esperanto summary)

Eschmeyer's Catalog of Fishes: Genera, Species, References. 2023. R. Fricke, W.N. Eschmeyer, R. Van der Laan (eds). Electronic version accessed 4 April 2023. URL: http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp.

Gratzianow V.I. 1902. Ikhtiofauna Baykala [Ichthyofauna of Lake Baikal]. Dnevnik Zoologicheskogo Otdelenya Obshchestva Lyubiteley Estestvoznaniya, Antropologii i Etnografii [Diary of the zoological department of the Society of Enthusiasts of Natural Science, Anthropology and Ethnography]. 3 (3): 18-61. (In Russian)

Goto A., Yokoyama R., Kinoshita I. et al. 2020. Japanese catadromous fourspine sculpin, Rheopresbe kazika (Jordan & Starks) (Pisces: Cottidae), transferred from the genus Cottus. Environmental Biology of Fishes. 103: 213-220. DOI: 10.1007/s10641-019-00921-3

Heckel J. J. 1840. Ichthyologische Beiträge zu den Familien der Cottoiden, Scorpaenoiden, Gobioiden und Cyprinoiden. [Ichthyological contributions to the families of Cottoids, Scorpaenoids, Gobioids and Cyprinoids.] Annalen des Wiener Museums der Naturgeschichte. [Annals of the Vienna Museum of Natural History.] 2: 143-164, Pls. 8-9. URL: https://www.biodiversitylibrary.org/page/11766207#page/171/mode/1up

International Commission on Zoological Nomenclature. 1999. International Code of Zoological Nomenclature: fourth edition International. London: Trust for Zoological Nomenclature. URL: https://www.iczn.org/the-code/the-international-code-of-zoological-nomenclature/

Kinziger A.P., Wood R.M., Neely D.A. 2005 Molecular Systematics of the Genus Cottus (Scorpaeniformes: Cottidae). Copeia. 2: 303-311. DOI: 10.1643/CI-03-290R1

Kontula T., Kirilchik S.V., Vainola R. 2003. Endemic diversification of the monophyletic cottoid fish species flock in Lake Baikal explored with mtDNA sequencing // Molecular Phylogenetics and Evolution. 27:143-155. DOI: 10.1016/S1055-7903(02)00376-7

Korotneff A. 1905. Die Comephoriden des Baikal-Sees [The Comephorids of Baikal Lake]. Wissenschaftliche Ergebnisse einer Zoologischen Expedition nach dem Baikal-Sees unter Leitung des Professors Alexis Korotneff in der Jahren 1900-1902. Zweite Lieferung. [Scientific results of a zoological expedition to Lake Baikal led by Professor Alex Korotneff in 1900-1902. Part 2]. Kiew und Berlin. (in Russian with summary in German) URL: https://archive.org/details/wissenschaftlich02koro/page/n43/mode/2up

Koryakov E.A., Sidelev G.P. 1976. The sculpins (Cottidae) of Lake Agatha on the Putoran Plateau. Journal of Ichthyology. 16 (3): 498-501.

Kottelat M. 1997. European freshwater fishes. Biologia. 52: 1-271.

La Cepède B.G.E. 1800. Histoire de Naturale des Poisons. [The natural history of fish.] Vol. 4. Paris: Plassan. (in Franch) URL: https://archive.org/details/histoirenaturel2lace/page/n5/mode/2up

Linnaeus C. 1758. Systema Naturae (Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata.) [The system of nature. Ed. 10. Vol. 1]. (in Latin) URL: https://www.biodiversitylibrary.org/item/80764#page/3/mode/1up

Pallas P.S. 1776. Reise durch verschiedene Provincen des Russischen Reiches. T. 3. Verlag der Russischen Kaiserlichen Akademie der Wissenschaften [Travel through different provinces of the Russian Empire]. Vol. 3. St. Petersburg: Publishing House of the Russian Imperial Academy of Sciences URL: https://elib.rgo.ru/safe-view/123456789/230592/1/ci0yNzdfUmVpc2UgZHVyY2ggdmVyc2NoaWVkZW5lIFByb-3ZpbnplbiBkZXMgUnVpc2NoZW4gUmVfMS5wZGY

Palmer G., White N.I. 1958 [1961]. Pisces. Zoological Record. 95: 1-141.

Pellegrin J. 1900. Poisson nouveau du lac Baikal [New fishes from Lake Baikal]. Bulletin du Muséum National d'Histoire Naturelle. [Bulletin of the National Museum of Natural History.]. 4 (7): 354-356. URL: https://www.biodiversitylibrary.org/item/27174#page/368/mode/1up

Shedko S.V., Miroshnichenko I.L. 2007. Phylogenetic relationships of sculpin *Cottus volki* Taranetz, 1933 (Scorpaeniformes, Cottidae) according to the results of analysis of control region in mitochondrial DNA. Journal of Ichthyology. 47(1): 21–25. DOI: 10.1134/S003294520701002X

Sideleva V.G. 1982. Seismosensornaya sistema i yekologiya baikal'skih podkamenshhikovyh ryb [Sensory system and ecology of the Baikal sculpins (Cottoidei)]. Novosibirsk: Nauka Publ. (in Russian)

Sideleva V.G. 1999. A new species of the endemic Baikal genus Batrachocottus (Cottidae). Journal of Ichthyology. 39 (3): 203-208.

Sideleva V.G. 2001. List of fishes from Lake Baikal with descriptions of new taxa of cottoid fishes. In: Alimov, A.F. (Eds.) New contributions to freshwater fish research. Proceedings of the Zoological Institute. 287: 45-79.

Sideleva V.G. 2002. Fish fauna of the area of high hydrothermal activity (Frolikha Bay, Lake Baikal), with the description of a new species of the genus *Neocottus* (Abyssocottidae). Journal of Ichthyology, 42 (2): 219-222.

Sideleva V.G. 2003. The endemic fishes of Lake Baikal. Leiden: Backhuys Publ.

Sideleva V.G. 2017. Redescription of *Cottus sibiricus* and an estimation of differences between this species and *Cottus dzungaricus* (Cottidae). Journal of Ichthyology. 57(6): 827-834. DOI: 10.1134/S003294521706011X

Sideleva V.G., Goto A. 2009. Species status and redescription of three species of the group Cottus poecilopus (Cottidae) from Eurasia. Journal of Ichthyology. 49 (8): 599-613. DOI: 10.1134/S0032945209080049

Smith W.L., Busby M.S. 2014. Phylogeny and taxonomy of sculpins, sandfishes, and snailfishes (Perciformes: Cottoidei) with comments on the phylogenetic significance of their early-lifehistory specializations. Molecular Phylogenetic and Evolution. 79: 332-52. DOI: 10.1016/j.ympev.2014.06.028

Taliev D.N. 1935. Novye formy bychkov iz Baikala [New forms of sculpins from Lake Baikal]. Trudy Baikalskoi Limnologicheskoi Stantsii [Proceedings of Baikal Limnologycal Station]. 6: 59-68. (In Russian, with German summary)

Taliev D.N. 1946a. Predki bajkal'skih Cottoidei v Cipo-Cipikanskih ozerah (sistema r.Vitima, bassejn Leny) [Ancestors of the Baikal Cottoidei in Tsipo-Tsipikan Lakes (Vitim-River System, Basin of the Lena)]. Doklady Akademii Nauk SSSR [Reports of the USSR Academy of Sciences]. 52 (8): 743-746. (In Russian)

Taliev D.N. 1946b. Novyi rod Cottoidei iz ozera Baikala [A new genus Cottoidei from Lake Baikal]. Doklady Akademii

Nauk SSSR [Reports of the USSR Academy of Sciences]. 54 (1): 89-92. (in Russian)

Taliev D.N. 1948. K voprosu o prichinah i tempah divergentnoj jevoljucii bajkal'skih Cottoidei [On the rate and causes of divergent evolution in the Cottoidei from Lake Baikal]. Trudy Baikalskoi Limnologicheskoi Stantsii [Proceedings of Baikal Limnologycal Station]. 12: 107-158. (In Russian)

Taliev D.N. 1955. Bychki-podkamenshhiki Bajkala (Cottoidei) [The Sculpins of Lake Baikal (Cottoidei)]. Moscow, Leningrad: Nauka Publ. (in Russian)

Tarkhova Yu.N. 1962. Materialy po vnutrividovoj izmenchivosti peschanoj shirokolobki [Data on the intraspecific variability of sand sculpin]. Short communications of Buryat Complex Research Institute. 3: 101-118. (in Russian)

Teterina V.I., Bogdanov B.E., Kirilchik S.V. 2022. Complete mitochondrial genomes and phylogenetic analysis of four Baikal endemic Batrachocottus species (Scorpaeniformes: Cottoidei). Mitochondrial DNA Part B-Resources. 7(1): 123-124. DOI: 10.1080/23802359.2021.2013741

Warpachowski N.A. 1889. Kratkie dannye po ikhtiofaune aziatskoy Rossii [Brief data on ichthyofauna of Asian Russia]. Zapiski Imperatorskoi Akademii Nauk [Notes of the Imperial Academy of Sciences]. 59 (1): 1-21. Pl. 1. (in Russian)

Yakovlev V.E. 1890. K ikhtiofaune Angary [To the ichthyofauna of the Angara River]. Izvestiia Vostochno-Sibirskogo otdiela Imperatorskago russkago geograficheskago obshchestva [Reports of the East Siberian branch of the Imperial Russian Geographical Society]. 21 (3): 49-57. (in Russian) URL: https://elib.rgo.ru/safe-view/123456789/213649/1/UnVQUkxJQjEyMDQ3MTk3LnBkZg

Yokoyama R., Sideleva V.G., Shedko S.V. et al. 2008. Broad-scale phylogeography of the Palearctic freshwater fish Cottus poecilopus complex (Pisces: Cottidae). Molecular Phylogenetics and Evolution 48: 1244-1251. DOI:10.1016/j.ympev.2008.02.002