Alexander Podossinov

Lomonosov Moscow State University / Institute of World History, RAS / «MFTI» /
Petrozavodsk State University. Moscow / Petrozavodsk . Russia. podossinov@mail.ru,

Alexander Mankov

Institute of Linguistics , RAS / St. Tikhon's Orthodox University for the Humanities.
Moscow, Russia. mankov@iling-ran.ru,

Evgeny Vdovchenkov

South Federal University. Rostov-na-Donu, Russia
vdovchenkov@yandex.ru

GR. γαγγάμη: OBJECT, WORD, ETYMOLOGY[1]

The article studies the Greek nouns γαγγάμη and γάγγαμον, which denote a certain fishing implement. The former occurs only in Strabo's Geography in his description of the Northern Black Sea region (VII, 3, 18) and later in Hesychius. It is not clear what object the γαγγάμη was and how it was used in fishing. The etymology of this word is not clear either. We discuss the occurrences of this noun in texts and conclude that γάγγαμον and γαγγάμη both denote a drag net; the former noun occurs only in this meaning, the latter also means 'gaff, a pole with a sharp metal end like a hook, fork, or trident'. In Strabo's text both meanings are applicable because both devices are used in ice fishing. It is believed that this word is of non-Indo-European origin, but we attempt to show that it may be related to PIE *gem- 'to grasp' and has cognates in other Indo-European languages, e.g. Baltic, Slavonic, and Germanic. The root is of onomato-poeic character; the form *gangam-* is reduplicative and originally expressed the iterativity of movements. We also describe ice fishing in regions of Russia which may be similar to the ancient fishing with the γαγγάμη: as is known, some fishing practices are very conservative and can remain unchanged for centuries.

Keywords: Strabo, Oppian, Hesychius, Bosporus, ancient Black Sea region, ancient fishing, gangame, gaff, adur, drag net, reduplication.

А. В. Подосинов

МГУ им. М. В. Ломоносова / ИВИ РАН /НИУ «МФТИ» / Петрозаводский гос.ун-т, Москва / Петрозаводск, Россия podossinov@mail.ru

А. Е. Маньков,

ИЯ РАН / Православный Свято-Тихоновский гуманитарный ун-т, Москва, Россия. mankov@iling-ran.ru

Е. В. Вдовченков,

Южный федеральный университет, Ростов-на-Дону, Россия vdovchenkov@yandex.ru

Др.-греч. γαγγάμη: вещь, слово, этимология

В статье рассматриваются древнегреческие существительные γαγγάμη и γάγγαμον, которые обозначают некое рыболовное орудие. Первая из этих форм встречается только в «Географии» Страбона в описании северного побережья Чёрного моря (VII, 3, 18) и затем у Гесихия. Чем именно являлась у Страбона *гангама* и как она использовалась не вполне ясно. Неясна и этимология этого слова. Случаи употребления показывают, что как γάγγαμον, так и γαγγάμη обозначают донный невод, однако γάγγαμον имеет только это значение, а γαγγάμη также значит 'острога; пешня; багор'. В тексте Страбона данное существительное может иметь оба значения, т. к. как и сеть, и пешня, и багор, и острога используются в подлёдной ловле рыбы. Считается, что это слово имеет неиндоевропейское происхождение, однако мы показываем, что оно допускает индоевропейскую этимологию и, возможно, имеет соответствия в родственных языках, а именно в балтийских, славянских и германских, восходя к корню *gem- 'хватать; сжимать'. Этот корень, по-видимому, является звукоподражательным; форма *gamgam- представляет собой редупликацию, выражающую многократность движений. В статье также описываются приёмы подлёдной ловли рыбы в различных регионах России, являющиеся, вероятно, параллелью ловле с помощью *гангамы*: как известно, орудия и способы лова рыбы весьма консервативны и передаются из столетия в столетие.

Ключевые слова: Страбон, Оппиан, Гесихий, Боспор, Северное Причерноморье в античности, рыболовство в античности, гангама, донный невод, острога, адур, редупликация.

In the 7th book of *Geography*, Strabo describes the Northern Black Sea region, including the area between the Borysthenes and the mouth of Lake Maeotis, which is characterised by severe winters. He mentions the following detail: ὀρυκτοί τέ εἰσιν ἰχθύες οἱ ἀποληφθέντες ἐν τῷ κρυστάλλῳ τῇ προσαγορευομένῃ γαγγάμη 'fish that become caught in the ice are obtained by digging with an implement called the "gangame"' (VII, 3, 18; Jones 1924: 225).

What Strabo meant by "gangame" is not fully clear; in this article we will try to find it out and propose an etymology of this word.

It is attested in two forms, γάγγαμον n. and γαγγάμη f. As such, the pattern of fluctuation between the neuter and feminine is ancient; it is caused by the coincidence of the nom. sg. feminine and nom.-acc. pl. neuter which both had $*-\bar{a} < *-eh_2$ in Proto-Indo-European (cf. Lat. *caementum* n. and *caementa* f., *gāneum* and *gānea*, *mendum* and *menda*, etc.). However, the gender differentiation could appear later, because, as is shown below, γάγγαμον and γαγγάμη denoted two different objects, which might have brought about the formal difference. The neuter form first occurs in Aeschylus (*Agam.* 361) and denotes a net in a figurative meaning (μέγα δουλείας γάγγαμον); it is a synonym of δίκτυον 'net', used a couple of lines above. In the literal sense, γάγγαμον (in the pl.: γάγγαμα 'drag nets') first occurs in Oppian in the *Halieutica* in the list of different kinds of fishing net, δίκτυα (III. 81). Oppian does not explain what this net looked like, but in scholia to the *Halieutica* it is described as follows: Γαγγάμη· γαγγάμη λίνος παχὺς δικτυωτὸς, σιδήρῳ κύκλῳ περιεχόμενος. γάγγαμα· γαγγάμη ἐστὶ λῖνος παχὺς (scholium 81), i.e. 'gangame: thick trellised net embraced by an iron circle; gangame is a thick net'. The form γάγγαμον also occurs in the *Onomasticon* by Julius Polydeuces (Pollux) in the list of fishing devices (X, 132). Besides, it is defined as an 'entwinement of sinews in the middle of the stomach in the area near the navel called by the many "seine"' (II, 169).[2] The feminine form γαγγάμη occurs in Strabo in the text cited above. In Strabo's *Chrestomathy*, γαγγάμη has an apposition τῷ ἐργαλείῳ, i.e. 'with a tool, instrument' (Casaubon 1620: 139). Important information in this regard is given by Hesychius, who provides the following definition of γαγγάμη: σαγήνη ἢ δίκτυον ἁλιευτικόν. καὶ σκεῦος γεωργικὸν ὅμοιον τῇ κρεάγρᾳ 'drag-net or a fishing-net, also a farming implement similar to a flesh-hook'.[3] Casaubon (1620: 139) explains γαγγάμη as "genus retis aut alius instrumenti ad capiendos pisces" (a kind of net or other device to catch fish). According to the *Thesaurus Graecae*

---

[2] τὸ δὲ κατὰ μέσην γαστέρα κοῖλον ὀμφαλὸς καὶ μεσομφάλιον, καὶ ὁ περὶ αὐτὸν τόπος γάγγαμον, ἐπεὶ νεύρων ἐστὶ πλέγμα, καθάπερ τὸ δικτυῶδες ὃ νῦν καλεῖται γάγγαμον ἢ ὡς οἱ πολλοὶ σαγήνη.

[3] A hook used to take meat out of the pot, or, generally, a hook to seize or drag by (Liddell, Scott 1996: 992).

linguae (II: 480), this implement could possibly be *furca aut tridens*, a fork or trident. As for γάγγαμον, it is defined by Hesychius as δίκτυον (Aesch. *Agam.* 361). καὶ τὸ περὶ τὸν ὀμφαλὸν τῶν ὑποχονδρίων 'a net, and one of the soft parts around the navel'.

This net was in use in the Mediterranean region up to much later times. It is described by Francesco Maurolico (1494–1575) in his *Tractatus de piscibus Siculis* ("Treatise on Sicilian fishes"), written in 1543 and published by Domenico Sestini in 1807: "Est aliud retiarium instrumentum, quod nostrates piscatores vocant *Gangamum,* forte quasi αχαμον, quod καμαι, hoc est humi trahatur: constat enim ex duobus semicirculis, uno ferreo, altero ligneo, quibus rete concavum insutum est; tum applicato fune ad capita semicirculorum, lentatoque, de navicula dimittitur, donec fundum attingat: mox acta in diversum navicula, per rudentem anchorae alligatum, instrumentoque per fundum maris raptato, ferreo semicirculo arenam, algamque radente, ligneo superstante. Confertur in reticulum multiplex piscium genus, Cancri, Camari, Bollaces, Conchae, Polypi, et alii"[4] (Maurolycus 1807: 298). As A.W. Mair (1928: xliii) points out, the name γάγγαμον (γαγγάμιον) is still used round the Black Sea. It is a dredge-net employed in fishing for sponges, oysters, and sea urchins. Mair cites a description of this net taken from *La Pêche en Grèce* (1883) by N. Apostolides: "autour d'un arc en fer est cousu un filet de forme conique; la corde, très large, de l'arc est aussi en fer; de la corde et de l'arc partent en rayonnant différentes cordes, au point de rencontre desquelles est attachée une grosse corde au moyen de laquelle on tire l'appareil."[5]

---

[4] "There is another fishing implement which the indigenous fishermen call *gangamum*, perhaps like αχαμον, because it is καμαι, that is, it is dragged on the ground, consists of two half-circles, one made of iron, the other of wood, to which the net, which curves inward, is sewn; then, with a rope attached to the tops of the half-circles and strained, it is put down from a boat till it reaches the bottom; then the boat is led in the opposite direction by means of a rope attached to an anchor, with the implement being dragged on the bottom of the sea; the iron half-circle scrapes the sand and seaweeds, the wooden is above it. Many kinds of fish are caught into this net: crabs, lobsters, sea urchins (?), oysters, octopi, and others." The form αχαμον (sic!) looks like a purposefully distorted pronunciation constructed to justify the fancied etymology which links the word to χαμαί 'on the ground' (κ may be a misprint).

[5] "Around an iron bow a conical-shaped net is sewn; the very wide bow-string is also made of iron; from this string and the bow radiate different

The New Greek forms are γαγγάμι 'net for oyster catching', γαγγάβα 'dragnet; boat used in sponge fishing'. Loans from Greek are Mediaeval Latin *gangamon* 'rete sinuosum variis plexibus involutum' (Du Cange 1885: IV, 24), Italian *gangama, gangamo, angamo* 'oyster net', Turkish *gamgam* 'tool for oyster catching', *gangava* 'dragnet or dredge used for sponge fishing; small boat used for sponge fishing'; for a fuller list of descendants of the Greek word, see Kahane, Kahane, Tietze 1958: 498–499. A detailed account of "gangamo" in the Mediterranean region of the post-Classical period is given by M. L. De Nicolò (2016: 11–32).

Judging by the textual evidence, both γάγγαμον and γαγγάμη denote a net, specifically a drag net, but there is also a semantic differentiation between these forms. While γάγγαμον exclusively denotes a net (Aeschylus, Oppian), γαγγάμη also denotes a certain tool with a hook[6]. S. Radt (2007: 270–271) argues that γαγγάμη in this context is actually a drag net rather than "eine Art Hacke", a kind of hoe. This net was put through a hole under the ice in order to catch fish there, rather than to pick out the fish frozen into the ice. His argument is that Hesychius defines γαγγάμη as a "farming implement", rather than a fishing implement. However, both a hook- or a hoe-like tool, e.g. a gaff, and a net are used in ice fishing, which makes it possible that γαγγάμη could really have these two meanings in the context in question.

This kind of fishing was in common practice in ancient times, and it is still in use now. In winter, nets are placed under the ice in the following fashion. A hole in the ice is made with a spike, then smaller holes are drilled in line with a distance of 2–3 m. Then, a pole with a rope attached to it is put down into the ice hole; this rope is pulled from one hole to the other. Then this rope, which is under the ice, is tied to a net, and the net is drawn under the ice. Sometimes, a line of small holes is not made in rivers, but the force of the current is used to pull the rope under the ice. Doing this, one should remember that the net can become frozen into the ice because

---

ropes, at the meeting point of which a large rope is attached, by means of which this device is dragged."

[6] Cf. Tozer 1893: 196 (a small round net; the ice was first broken, and the fish then extracted with a net); Jones 1924: 225 (a pronged instrument like a trident); Höppener 1931: 42, 107 (an iron hook; drag net; in Strabo VII, 3, 18 it is used in the former meaning); Bekker-Nielsen 2005: 92 (small net that can be handled by one person).

when the frost is heavy, ice gets thicker up to 10 cm a day. In the Azov Sea nowadays, fishermen make holes in the ice and do the fishing with a net pulled through these holes (E.V. Vdovchenkov's own observations).

In ethnographic studies of more recent times, there are descriptions of traditional ways of ice fishing that may cast light on Strabo's mention of γαγγάμη. For example, I.F. Blaramberg in his *Memoirs* of 1843, describes his trip to the Ural River to Ural cossacks and ice fishing for sturgeons. Cossacks come down to a river in large groups with gaffs and short iron crowbars in order to break the ice, that is, to make round holes that would be big enough to pull out the fish. After a signal, "fishermen dressed in short fur coats and high boots rushed down from the elevated bank onto the ice, broke it in hundreds of places, deftly put down into the ice-holes their long poles with iron hooks, and in less than a minute, hundreds of blood-stained sturgeons were tossing on the white snow" (Blaramberg 1978).

One more example is a description of ice fishing for sturgeon in the Angara (in oral narratives of old Russian residents of Baikal Siberia). The most usable tool in ice fishing for sturgeons was the so-called *adur* (Rus. *áдур*), a big gaff looking like a forged fork with three or four tines and a long shaft which could be made of several poles depending on the depth of the river. Fishermen made a large furrow or a hole in the ice. They had to figure out where there were fish, therefore several holes could be made. When they found the fish, the ice-hole was widened up to 1.5 m and more. To handle the adur, considerable physical strength was required. One adur could be manipulated by two to ten people (Rus. *адурщики*). Together they made a blow and forced the adur down, so that the tines went deeper. If successful, one gaff could catch up to 3–4 and sometimes 6–7 sturgeons at once. The fish were pulled out onto the ice, and the whole thing was repeated (Makarenko 1902; Egorov 1943; Misharin 1950; Podlednaya lovlya osetra).

It is possible that Strabo's γαγγάμη was such "long pole with iron hooks". Not any fish, which abound in the Azov Sea, were caught in the manner described above. In all likelihood, as Strabo mentions in the same passage, these were ἀντακαῖοι, "which are about the size of dolphins". Perhaps, this was a variety called the "starry sturgeon" (*Acipenser stellatus*, Rus. *севрюга*) (Braund 2023: 237). Ethnographic accounts cited above also mention sturgeons.

Judging by archaeological evidence, the main fish caught in the Bosporus was herring. In the second place were sturgeons, which were probably exported (Marti 1941: 97; Zin'ko 2023a: 96). Among sturgeons prevails the starry sturgeon (Zin'ko 2023a: 94), which is shown on coins of Pantikapaion (Zin'ko 2023b: 166–167, fig. 72). As archaeozoological evidence suggests, in Tanais, for example, sturgeons, catfish, and carps were economically important (Tsepkin 1970: 116; Matera 2017: 168). The large size of Strabo's *antakaioi* corresponds well with remains found in Tanais, e.g. of a great sturgeon of up to 250 cm, starry sturgeon of 150 cm, and a sturgeon of 180 cm (Tsepkin 1961; 1970; Matera 2017: 169).

Ice fishing involved both nets and pike poles or gaffs, but in regard to Strabo's account the latter way, i.e. the use of iron implements, looks likelier. This opinion is shared by V. Yu. Marti, who assumed that the gangame was a gaff (Rus. *острога*, Marti 1941: 97). In winter, sturgeons gathered in bottom holes and deepenings. Using materials from Belozerskoe Settlement located in the mouth of the Dnieper, V. P. Bylkova and E. Yu. Yanish suggest that great sturgeons and starry sturgeons were caught in rivers primarily during spawning in winter, when the concentration of fish was quite large; this could considerably increase the number of fish caught (Yanish, Bylkova 2013: 356). Winter fishing for slow-moving sturgeons from bottom holes using pike poles and gaffs was very effective. As for the fish caught in the ice (Strabo VII, 3, 18), this could refer to nets frozen into the ice (cf. Stolba 2005: 123–124).

Gr. γαγγάμη, γάγγαμον do not have a commonly accepted etymology. R. Beekes (2010: 253–254) assumes that it is a loanword going back to the pre-Greek substrate (more tentatively Frisk 1960: 281). G. Neumann (1961: 100) suggested that it is related to the Anatolian verb "hang", i.e. *kānk-ⁱ/kank-* (Kloekhorst 2008: 437), because Oppian, who originated from Cilicia, could use an Anatolian form in his work. This suggestion is erroneous because this word had occurred as early as in Aeschylus, many centuries before Oppian. We believe that γαγγάμη allows for an Indo-European etymology, cf. the following Germanic forms: Sw. *kink* (*-en, -ar*) 'metal hook with bait; gaff used to catch zander and perch in ice holes in winter' (SAOB: K 962); etymologically, this is probably the same word as Sw. *kink* in the sense 'loop, knot' (marine term, SAOB: K 961), Engl. *kink* 'twist, curl'. Further cf. Icel. *kinka* f. 'sailor's knot', *kinka* 'to nod; turn quickly' (Magnússon 1989: 461). Different vocalism is found in Sw. *kånka* 'to lug', where *å* < PScand. and PGerm. **a* before *nk* (Wessén 1965: 74). Gr.

γαγγάμη is in all likelihood a reduplicative form *gam-gam-. The development is reconstructed as PIE *gam-gam- > PGerm. *kan-kam- > *kank-, whence Sw. kånka; for the change of *m > n* in this position, cf. Noreen 1923: 187. Engl., Sw. kink reflects PGerm. *kenk-, with secondary ablaut. The reduplication in γαγγάμη and in its possible Germanic cognates probably expresses iterativity. A similar formation is PIE *kʷe-kʷl-o- in words for wheel, e.g., Skt. cakra-, and for neck, Lith. kãklas (Brugmann 1906: 129; Fortson 2004: 117), to PIE *kʷel- 'to turn', cf. Lat. colō 'to live; to cultivate', ORus. kolo 'wheel'. It can also be noted that reduplication is systematically used in Sanskrit to make frequentative verbs, e.g. cekrīyate, carkarti, carikarti, carkarīti, carikarīti, carīkarīti 'do again and again' of kṛ 'do, make', cañcūryate, cañcurīti, cancūrti 'walk again and again' of car 'walk, move'; for more examples see Deshpande 2014: 371–371. This kind of reduplication has an iconic character and allows for a large number of forms; it does not follow the same phonological rules as reduplication in the perfect, present, and aorist. Reduplication is systematically observed in Armenian in iterative verbs, e.g. vazvzel 'run about, run here and there', kʰaškʰšel 'pull hard, tug', dzgdzgel 'drag out; delay' (pronounced [vaz.və.ˈzɛl, kʰaʃ.kʰə.ˈʃɛl, ʤəg.ʤə.ˈgɛl]) to vazel 'run', kʰašel 'pull', dzgel 'draw, drag' (Garibyan, Garibyan 1965: 168), cf. also such nouns as dzgdzgum 'protraction, procrastination'.

The next question is what root was reduplicated in γαγγάμη, i.e. what its cognates without the reduplication are. The possible form in this regard is PIE *gem- 'drücken, zusammenpressen; fassen' (LIV 186, cf. Gr. (Hom.) γέντο, aorist, '(he) grasped' (Il. 8. 43) and probably γέμω 'to be full; to be filled' (Frisk 1960: 281; Beekes 2010: 265, 266), Rus. жму, жать 'to press, squeeze', PSlav. *ž ̨eti (Derksen 2008: 561). Semantically, this parallel is quite plausible and allows us to explain γαγγάμη as "an object used to grasp something; grasper, seizer". Reduplication in this case is used to form a word which is a different part of speech, i.e. a noun from a verb (see Rozhanskiy 2011: 79ff.)

However, the alternation *gem- (in γέντο) / *gam- (in γαγγάμη) is not phonetically regular, because the vowel *a* does not take part in standard ablaut alternations (Lubotsky 1989: 53; Pronk 2019: 123). This came to be the reason for the assumption about the non-Greek and non-Indo-European character of γαγγάμη. As is known, the vowel *a* is typical of onomatopoeic and descriptive words like PIE *bal-bal-, bar-bar-, cf. also Skt. kakhati 'to laugh, laugh at or deride', Gr. καχάζω 'laugh aloud', etc. (Pokorny 1959: 91; see also

a collection of examples in Brugmann 1906: 127). The existence of *gam-gam-* alongside the semantically proximate *gem-* makes us believe that these roots are onomatopoeic, cf. the sound of an abrupt exhalation followed by a labial sound when grasping something. Consequently, they do not comply with the regular ablaut pattern. The root *gem-/gam-* may be further related to a large group of Balto-Slavic and Germanic words meaning "lump; heap" as something made by rapid grasping movements. Cf. Lith. *gãmalas, gãmulas, gamulỹs* 'lump, chunk', *gùmulas, gùmuras* 'id.', *gùmuliuoti* 'to crumple', etc.; here also belongs Lith. *gamulà* 'hornless cow; run-down person' (because of rounded protuberances instead of horns). Slavic cognates: Serbo-Croat. *gòmoḷa* 'piece of cheese', *gomuḷa* 'big heap of stones', Slovenian *gomòlj* 'chunk', Czech *homole* 'cone', dial. *gomol'a* 'horness cow', *gomolý* 'hornless', Rus. *гомо́ла* 'chunk; ball', Ukr. *гомилá* 'tall clumsy fellow'; for more derivatives see Fraenkel 1962: 132; Vasmer 1967: II, 435; Trubachev 1980: 18. O.N. Trubachev considers these forms to be onomatopoeic (Trubachev 1980: 19), but doubts their relationship with γέμω. R. Derksen (2015: 163) provides Balt. *gamalas* with a note "etymology unknown". Germanic cognates: Norw. (nynorsk) *kuml* 'lump, clod', *kumle* 'clumsy person', *kumla* 'to mix up; bring in disorder', OE *cuml* 'wound, swelling' (Torp 1919: 335), Sw. *kummel* 'piece of wood used as a mark; cairn; barrow; clumsy person, lout' (SAOB: K 3188). In a striking parallelism to these forms are the forms with the initial *k*, e.g. Lith. *kemšù, kim̃šti* 'to cram, stuff', *kamuolỹs* 'ball of yarn', *kẽmuras* 'heap', Rus. *ком* 'lump', *комолый* 'hornless' (Vasmer 1967: II, 300, 304; Trubachev 1983: 174, 179). The alternation *g/k* is a sign of the descriptive character of the root.

In connection with this, the forms γνάμπτω 'to bend' and γναμπτός 'bent, curved' should be mentioned. Taken as such, they cannot have a PIE preform (Beekes 2010: 279), but it is not excluded that *gnampt-* is a result of simplification of the reduplicated form *gamgam-*.

Let us summarise the results. Gr. γάγγαμον and γαγγάμη both denote a drag net; the former noun occurs only in this meaning, the latter also means 'gaff, a pole with a sharp metal end like a hook, fork, or trident'. In Strabo's text both meanings are applicable because both devices are used in ice fishing. The form *gangam-* is reduplicative and originally expressed the iterativity of movements. It may be related to PIE *gem-* 'to grasp'; the root is of onomatopoeic character.

References

Beekes, R., with the assistance of L. van Beek (2010) *Etymological Dictionary of Greek*, I–II. Leiden; Boston: Brill.

Bekker-Nielsen, T. 2005: The Technology and Productivity of Ancient Sea Fishing. In: Bekker-Nielsen, T. (ed.) *Ancient Fishing and Fish Processing in the Black Sea Region*. Aarhus University Press, 83–95.

Blaramberg, I. F. 1978: *Vospominaniya* [*Memoirs*]. Moscow: Nauka.
Бларамберг И. Ф. *Воспоминания*. М.: Наука, 1978.

Braund D. 2023: Antakaios: Aphrodite's Sturgeon? *Проблемы истории, филологии, культуры*. 3, 231–240.

Brugmann, K. 1906: *Vergleichende Laut-, Stammbildungs- und Flexionslehre nebst Lehre vom Gebrauch der Wortformen der indogermanischen Sprachen*. 2nd ed. Vol. 2.1. Strassburg: Karl J. Trübner.

Casaubon, I. 1620: *Commentarius et castigationes ad lib. Strabonis Geograph. XVII*. In: Casaubon, I. (ed.) *Strabonis rerum geographicarum libri XVII*. Paris: Typis regiis.

Derksen, R. 2008: *Etymological Dictionary of the Slavic Inherited Lexicon*. Leiden; Boston: Brill.

Derksen, R. 2015: *Etymological Dictionary of the Baltic Inherited Lexicon*. Leiden; Boston: Brill.

Deshpande, M. 2014: *A Sanskrit Primer*. Ann Arbor. (Michigan papers on South and Southeast Asian Studies, 47).

Du Cange, C. et al. 1885: *Glossarium mediae et infimae latinitatis*, vol. IV. Niort: L. Favre (http://ducange.enc.sorbonne.fr/).

Egorov, A. G. 1943: *Promysel krasnoy ryby na reke Angare* [*Redfish fishery in the Angara river*]. Irkutsk.
Егоров А. Г. *Промысел красной рыбы на реке Ангаре*. Иркутск: Иркутское областное издательство, 1943.

Fortson, B. W. 2004. *Indo-European Language and Culture: An Introduction*. Blackwell.

Fraenkel, E. 1962: *Litauisches etymologisches Wörterbuch*. Heidelberg: Carl Winter; Göttingen: Vandenhoeck & Ruprecht.

Frisk, Hj. 1960: *Griechisches etymologisches Wörterbuch*. Heidelberg.

Garibyan, A. S., Garibyan, Dzh. 1965: *Kratkiy kurs armyanskogo yazyka* [*Short course of the Armenian language*]. Yerevan.
Гарибян А. С., Гарибян Дж. 1965: *Краткий курс армянского языка*. Ереван: Луйс.

Höppener, H. 1931: *Halieutica. Bijdrage tot de kennis der Oudgriekse visscherij*. Amsterdam: H. J. Paris.

Jones, H. L. (ed.) 1924: *Strabo. Geography. Books 6–7*. Cambridge, MA; London: Harvard University Press.

Kahane, H., Kahane, R., Tietze, A. 1958: *The Lingua Franca in the Levant. Turkish Nautical Terms of Italian and Greek Origin*. Urbana: University of Illinois Press.

Kloekhorst, A. 2008: *Etymological Dictionary of the Hittite Inherited Lexicon*. Leiden; Boston: Brill.

Liddell, H. G., Scott, R. 1996: *A Greek-English Lexicon with a revised supplement*. Oxford University Press.

LIV — *Lexikon der indogermanischen Verben. Die Wurzeln und ihre Primärstammbildungen*. Unter Leitung von Helmut Rix und der Mitarbeit vieler anderer bearb. von M. Kümmel, Th. Zehnder, R. Lipp, B. Schirmer. 2. Aufl. bearb. von M. Kümmel und H. Rix. Wiesbaden: Dr. Ludwig Reichert Verlag, 2001.

Lubotsky, A. 1989: Against a Proto-Indo-European phoneme **a*. In: Venneman, Th. (ed.) *The New Sound of Indo-European. Essays in Phonological Reconstruction*. Berlin; New York: Mouton de Gruyter, 53–79.

Magnússon, Ásgeir Blöndal 1989: *Íslensk orðsifjabók*. Orðabók háskólans.

Mair, A. W. (ed.) 1928: *Oppian, Colluthus, Tryphiodorus*. London: William Heinemann; New York: G.P. Putnam's Sons.

Makarenko, A. A. 1902: *Promysel krasnoy ryby na Angare: s 10 risunkami i 6 kartami* [*Redfish fishing in the Angara: with 10 pictures and 6 maps*]. St. Petersburg.

Макаренко А. А. 1902: *Промысел красной рыбы на Ангаре: с 10 рисунками и 6 картами*. С.-Петербург.

Marti, Yu.V. 1941: [New data on fishery in the Kimmerian Bosporus using the material of excavations in Tyritake and Myrmecium]. *Sovetskaya arkheologiya* [*Soviet archaeology*] 7, 94–106.

Марти В. Ю. 1941: Новые данные о рыбном промысле в Боспоре Киммерийском по раскопкам Тиритаки и Мирмекия. *Советская археология* 7, 94–106.

Matera, M. 2017: [Fish industry of Tanais. The rôle and place of fishing in the economic life and economy of the Society of Tanais]. In: M. Matera, R. Karasiewicz-Szczypiorski (eds) *The Crimea and the Northern Black Sea Coast in Archaeological Research 1956–2013* (Światowit Supplement Series C: Pontica et Caucasica, vol. 1). Warsaw, 165–180.

Матера М. 2017: Рыбный промысел Танаиса. Роль и место рыболовства в хозяйственной жизни и экономике населения Танаиса. В сб.: M. Matera, R. Karasiewicz-Szczypiorski (eds) *Крым и Северное Причерноморье в археологических исследо-ваниях 1956–2013 гг.* (Światowit Supplement Series C: Pontica et Caucasica, vol. 1). Warsaw, 165–180.

Maurolycus, Fr. 1807: *Francisci Maurolyci Tractatus de piscibus Siculis ad Petrum Gillium*. In: D. Sestini. *Viaggi e opuscoli diversi*. Berlin, 285–302.

Misharin, K. I. 1950: *Ryby i rybnyy promysel v Irkutskoy oblasti* [*Fish and fishery in Irkutsk region*]. Irkutsk: Irkutskoe oblastnoe izdatel'stvo.

Мишарин К. И. *Рыбы и рыбный промысел в Иркутской области*. Иркутск: Иркутское областное изд-во, 1950.

Neumann, G. 1961: *Untersuchungen zum Weiterleben hethitischen und luwischen Sprachgutes in hellenistischer und römischer Zeit*. Wiesbaden: Harrassowitz.

Nicolò, M. L. De 2016: Mediterraneo dei pescatori, Mediterraneo delle reti.

Noreen, A. 1923: *Altisländische und altnorwegische Grammatik*. Halle: Niemeyer.

Podlednaya lovlya osetra adurom na Angare (*v ustnykh rasskazakh russkikh starozhilov Baykal'skoy Sibiri*) [*Ice-hole fishing for sturgeons using the adur on the Angara (in oral narratives of old Russian residents of Baikal Siberia*], available at https://sibfolk.ru/?p=1706 (23.03.2024).
Подлёдная ловля осетра адуром на Ангаре (в устных рассказах русских старожилов Байкальской Сибири), https://sibfolk.ru/?p=1706.

Pokorny, J. 1959. *Indogermanisches etymologisches Wörterbuch*. Bern; München: Francke.

Pronk, T. 2019: Proto-Indo-European **a*. *Indo-European Linguistics* 7, 122–163.

Radt, St. 2007: *Strabons Geographika, Bd. 6. Buch V–VIII: Kommentar*. Göttingen: Vandenhoeck & Ruprecht.

Rozhanskiy, F.I. 2011: *Reduplikatsiya: opyt tipologicheskogo opisaniya* [*Reduplication: an attempt at typological description*]. Moscow.
Рожанский, Ф. И. 2011: *Редупликация: опыт типологического исследования*. М.: Знак, 2011.

SAOB — *Svenska Akademiens ordbok över svenska språket*, I–XXXIX. Lund, 1898–2023 (https://www.saob.se/).

Stolba, V. 2005. Fish and Money: Numismatic Evidence for Black Sea Fishing. In: Bekker-Nielsen, T. (ed.) *Ancient Fishing and Fish Processing in the Black Sea Region*. Aarhus University Press, 115–132.

Thesaurus Graecae linguae — Hase, C. B., Dindorfius, G., Dindorfius, L. 1833: *Thesaurus Graecae linguae ab Henrico Stephano constructus*, vol. II. Paris: Didot.

Torp, A. 1919: *Nynorsk etymologisk ordbok*. Kristiania: H. Aschenhoug & Co. (W. Nygaard).

Tozer, H. F. 1893: *Selections from Strabo. With an Introduction on Strabo's Life and Works*. Oxford: Clarendon Press.

Trubachev, O. N. (ed.) 1980: *Etimologicheskiy slovar' slavyanskikh yazykov. Praslavyanskiy leksicheskiy fond* [*Etymological dictionary of the Slavonic languages. Proto-Slavonic lexicon*]. Vol. 7. Moscow: Nauka.
Трубачёв О. Н. (ред.) 1980: *Этимологический словарь славянских языков. Праславянский лексический фонд*. Вып. 7. М.: Наука.

Trubachev, O. N. (ed.) 1983: *Etimologicheskiy slovar' slavyanskikh yazykov. Praslavyanskiy leksicheskiy fond* [*Etymological dictionary of the Slavonic languages. Proto-Slavonic lexicon*]. Vol. 10. Moscow: Nauka.
Трубачёв О. Н. (ред.) 1983: *Этимологический словарь славянских языков. Праславянский лексический фонд*. Вып. 10. М.: Наука.

Tsepkin, E. A. 1961: [Fishes of Tanais (fishery in the estuary of the Don river in the 2nd — 1st cc. BC]. *Voprosy ikhtiologii* [*Issues in ichthyology*]. 1/3 (20), 448–452.

Цепкин Е. А. 1961: Рыбы городища Танаис (о рыболовстве в дельте р. Дон во II–I веках до н.э.). *Вопросы ихтиологии*. Т. 1, вып. 3 (20), 448–452.

Tsepkin, E. A. 1970: [New materials for the history of fishery in Tanais]. *Kratkie soobshcheniya Instituta arkheologii* [*Brief communications of the Institute of Archaeology*]. 124, 115–117.

Цепкин Е. А. 1970: Новые материалы к истории рыбного промысла в Танаисе. *Краткие сообщения Института археологии*. Вып. 124, 115–117

Vasmer, M. 1964–1973: *Etimologicheskiy slovar' russkogo yazyka. Perevod s nemetskogo i dopolneniya O. N. Trubacheva* [*Etymological dictionary of the Russian language. Translation from German and additions by O. N. Trubachev*]. Vols 1–4. Moscow.

Фасмер, М. 1964–1973: *Этимологический словарь русского языка*. Перевод с немецкого и дополнения О. Н. Трубачёва. М.: Прогресс.

Wessén, E. 1965: *Svensk språkhistoria*. I. *Ljudlära och ordböjningslära*. Stockholm: Almqvist & Wiksell.

Yanish, E. Yu., Bylkova, V. P. 2017: [Analysis of osteological material from the archaeological site of Belozerskoe Settlement (4th c. BC)]. In: As'keev, I. V., Ivanov, D. V. (eds) *Dinamika sovremennykh ekosistem v golotsene* [Dynamics of the modern ecosystems in Holocene. Conference proceedings]. Kazan, 354–357.

Яниш Е. Ю., Былкова В. П. 2017: Анализ остеологического материала из археологического памятника Белозерское поселение (IV до н.э.). В сб.: Аськеев И. В., Иванов Д. В (ред.) *Динамика современных экосистем в голоцене. Материалы Третьей Всероссийской научной конференции*. Казань, 354–357.

Zin'ko, A. V. 2023a: [Fishery in the Cimmerian Bosporus]. *Bosporskie issledovaniya* [*Bosporan studies*] 46, 92–115.

Зинько, А. В. 2023: Рыбный промысел на Боспоре Киммерийском. *Боспорские исследования* 46, 92–115.

Zin'ko, A. V. 2023b: *Ellinskie moreplavateli Bospora Kimmeriyskogo (VI v. do n.e. — VI v. n.e.)* [*Greek seafarers of the Cimmerian Bosporus (4th c. BC — 6th c. AD)*]. Simferopol; Kerch.

Зинько А. В. 2023: *Эллинские мореплаватели Боспора Киммерийского (VI в. до н.э. — VI в. н.э.)*. Симферополь; Керчь, 2023.