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ARTICLE

Ear-y fish: shells in two Tocharian B medical prescriptions

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Abstract

Two Tocharian B manuscripts, PK AS 3B and IOL Toch 306, contain an ingredient *läksañña klautso*, lit. "fish ear", that, in earlier editions and translations, has been interpreted as "(fish) gill". However, no concrete evidence has been brought forward to interpret "fish ears" in this context as "gills", nor is there convincing evidence for the use of "gills" in (traditional) medicine for the dermatological and gastrointestinal conditions described in these manuscripts. By examining the term for "shell" in Nakh-Dagestanian languages (e.g. Avar ччугълъгълуи /č:uʕiʕin/, lit. "fish ear") and highlighting metaphorical associations of related words, e.g. German *Ohrmuschel* "auricle", we argue that *läksañña klautso* refers to shells and conches rather than gills. Additionally, we provide instances of the use of conches and shells in Āyurvedic and traditional Chinese medicine to support our claim. Accordingly, we suggest that "ground shell (powder)" is the ingredient listed in these two remedies.

Keywords: Tocharian; Nakh-Dagestanian; Etymology; Medical prescriptions; Shell powder; Āyurvedic medicine; Traditional Chinese medicine

1. Introduction

The medical text PK AS 3B, written in Tocharian B, contains two remedies derived from *läksañña klautso*. It is listed alongside components obtained from plants and cow dung in the form of a TochB *ṣpel* that is applied, e.g. to (twofold) wounds. The literal translation of this syntagma is "fish ear", which in earlier research has been interpreted as "fish gills" (cf. e.g. "ouïe de poisson" in Filliozat 1948: 52 and "gill [lit. fish ear]" in CEToM).

However, previous commentaries do not include philological arguments for their interpretation of this syntagma as "fish gill". Although "fish" and "ear" can be observed to form a word for "gill", as exemplified by dialectal High German *Fischohr* (Adelung 1796: 172; DW III: 1687), factual evidence for the use of gills in the contexts in which *läksañña klautso* appears has yet to be brought forward.[1] This paper provides an alternative interpretation of the syntagma *läksañña klautso*. In short, we argue that *läksañña klautso* does not mean "gill" but rather "shell" or "conch". Accordingly, we suggest that the medical prescription refers to "ground shell" or "shell powder". To substantiate our claim, we present hitherto unnoticed lexical parallels from Nakh-Dagestanian languages and highlight cross-linguistic metaphorical associations of "shell/conch" and "ear". Finally, we show that ground shells

[1] For an occurrence of the medicinal usage of fish gills in Chinese medicine, see Section 4.3.2.

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had several different applications in Āyurvedic and traditional Chinese medicine, which present the most influential medical traditions of the area.

Section 2 introduces the textual evidence containing *läksaññа klautso*. The etymology of the forms involved, as well as certain issues relating to their morphosyntax, are discussed in Section 3. Our own interpretation is then laid out in Section 4, and Section 5 contains the paper's conclusions.

2. Attestations of *läksaññа klautso*

The syntagma *läksaññа klautso* occurs in at least two TochB manuscripts. In Sections 2.1 and 2.2, we briefly discuss the passages which contain the relevant syntagma and contextualize them within the content of the manuscripts. If not otherwise specified, general information about the discussed manuscripts stems from CEToM.

2.1. PK AS 3B a1–b3

Manuscript PK AS 3B contains a medical text written in prose. It was retrieved from Dunhuang and is part of the Parisian collection of the *Bibliothèque nationale de France* (Pelliot Koutchéen). The manuscript is well preserved and, although incomplete, presents one of the more extensive TochB texts, comprising six lines, each containing around three dozen characters. The language and the Brāhmī script of the manuscript are characterized as classical. The text was first edited and translated by Filliozat (1948: 51–3)[2] and subsequently discussed by Sieg (1955: 68–9, reprinted as Sieg 2014), who made several corrections to Filliozat's readings.

As for the structure of the text, it follows the disease-oriented scheme (cf., for instance, Hippoc. *Nat. mul.*). First, the disease is introduced, and then its treatments are listed after the phrase *ñake no saṃtkenta weñau* "now I will state the remedies" (Peyrot 2013: 657). Thus, in the first line of manuscript PK AS 3B a1, one ailment can confidently be identified as *dvivraṇi* "two kinds of ulcers/wounds" (CEToM), a term borrowed from Sanskrit *dvivraṇīya-* "relating to the twofold wounds" (MW: 505). This ailment also appears in PK AS 3A b1, as in the LOC.SG *dvivräṇine pilene* "[i]n case of the [two kinds of] wounds" (CEToM). The other disease, mentioned in PK AS 3B a1, is *kok-* (documented in the locative singular *kokne*). It has been suggested to translate *kok-* as "gangrene" or "sores" in CEToM. Although it must be acknowledged that there is not much evidence for this reading, notably because there is currently no convincing etymology,[3] it fits well with our interpretation of *terwe* appearing in the same text as referring to a "wound" (see below in this section).

Lines a2 to a6 contain lists of ingredients along with instructions for how to apply them in a medical context. Although the lines are missing five to six akṣaras (CEToM), we believe the listed remedies still refer to twofold wounds. Considering the mode of introducing a disease and the usual size of these TochB manuscripts, the missing parts would hardly be large enough to contain the reference to another disease.

Line a6, the last line on the front side of the manuscript, contains the first of two attestations of *läksaññа klautso*. This syntagma occurs in a list of ingredients used for preparing a *ṣpel* (cf. Example 1). Together with *Symplocos racemosa* (TochB *śabaralodrä*, cf. Sanskrit *śabaralodhra-*"a kind of Lodhra", MW: 1052), blue lotus leaves (TochB *uppäläṣṣana piltāsa*), a *dhānyamāṣa*[4] (of) *Withania somnifera* (TochB *aśvakate*, cf. Sanskrit *aśvagandhā-* "the plant

[2] Filliozat (1948: 51) reads *laksaña klautso* and *laksaññai klautsaiṣṣe* with /a/ rather than /ä/ in the first syllable of the first word, however the correct reading is ⟨lä⟩.

[3] See DTB[2]: 202–3, 214 for a tentative connection to Old Irish *cucht* "external appearance, form, shape, aspect" (eDIL: s.v.) and Old Norse *háttr* "manner, habit" (Cleasby and Vigfusson 1874: s.v.).

[4] An as yet undetermined unit of measurement (MW: 514)

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Physalis Flexuosa", MW: 115), and cow dung[5] (TochB *kewiye melteṣṣe*), *läksañña klautso* is to be strewn over the wound. Then, the wound is to be covered with a bandage (TochB *śwele*).[6]

(1) *śabaralodrä • uppäläṣṣana piltāsa • dhanyamāṣ /// (a)- | śvakate* • ***läksaña klautso*** • *kewiye melteṣṣe ṣpel te śār kätnälle kampāsäṣṣe śwelesa śanmäṣälle* [...] (PK AS 3B a5–a6, adapted from CEToM)

The nature of *läksañña klautso* is not further described in the text. However, the fact that the drug is to be strewn over the wound suggests that it is a sort of powder or something similarly fine-grained.

The second occurrence of *läksañña klautso* in manuscript PK AS 3B is on line b2. The manner of application is similar to that in Example (1), although here, no bandage is mentioned, cf. Example (2). Together with cow dung powder (TochB *kewiye melteṣṣe ṣpel*), an unidentified ingredient,[7] and red chalk (TochB *gairikäṣṣe*, derived from *gairik*, borrowed from Sanskrit *gairika-* "gold; red chalk", cf. MW: 363; EWAia III: 161)[8] in the form of a powder as well, *läksañña klautso* is to be strewn over the diseased body part or otherwise smeared cold over it.

(2) [...] *terwe ke= tsākaṃ-ne sātke • || kewiye melteṣṣe ṣpel* ***läksañña klautsaiṣṣe ṣpel*** */// ṣpel gairikäṣṣe ṣpel te śār kätnälle epe no kroścana tonak śār lupṣallona toṃ prayokänta y(amaṣṣällona) /// dvivräṇikalp yasarsa saitsi śpālmeṃ.* (PK AS 3B b2–b4, adapted from CEToM)

As indicated above, all these ingredients are to be administered in the form of a powder. According to the recent interpretation by Huard (2022), this is the meaning of TochB *ṣpel*. In earlier publications, TochB *ṣpel* is translated variously: "pill" (cf. French boulette in Filliozat's 1948: 52 translation), "pellet" (CEToM), or "mud; (medicinal) mud-pack, poultice" (DTB[2]: 73). However, as Huard (2022: 432) points out, these readings are not entirely convincing because, on the one hand, they do not fit all the contexts in which *ṣpel* occurs and, on the other, it would be unnecessary to repeat *ṣpel* with every ingredient, as is done in PK AS 3B b2–b3, if it would designate an application made of all the listed ingredients; a single mention would be sufficient. By revisiting the individual attestations of *ṣpel*, Huard (2022: 429–34) then argues that the contexts in which it occurs suggest the reading "powder".[9] As will become apparent in the following sections, this interpretation squares well with our reading of *läksañña klautso*. The fact that in the following sentence it is further stated that the prepared drug is to be smeared over the wound (*śār lupṣallona* "to be smeared over") becomes clear when it is considered that the drug is to be used with blood.[10]

Moreover, PK AS 3B b2–b3 provides us with a further specification of the ailment treated by means of the prescription: *terwe ke = tsākaṃ-ne sātke*, which has been interpreted in various ways, as discussed below and summarized in Table 1. The difficulty is the interpretation

[5] On the use of cow dung to treat wounds, cf., e.g. Gololo et al. 2019 and de Vries 2019.

[6] Full translations of the passages discussed, including our own interpretations, are given in Section 5.

[7] PK AS 3B b3 begins with *ṣpel*, but the ending of line b2 is cut off, thus suggesting that a further ingredient was named beforehand.

[8] Solely Adams (DTB[2]: 265 s.v. *gairik*) translates TochB *gairik* as "'yellow arsenic' (a medical ingredient)", without, however, giving any reason as to why he prefers this reading over "red chalk".

[9] Note that this reading renders the etymology of TochB *ṣpel* and TochA *ṣpal* proposed by Malzahn (2014: 260) unconvincing.

[10] See Example 9 in Section 5 for translations of PK AS 3B a5–a6 and PK AS 3B b2–b4.

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Table 1. Translations of (*lope*) • *terwe ke* = *tsākaṃ-ne sātke*

Translation	Source
... remède dans ...	Filliozat 1948: 52
Wenn jemanden (die Salbe) sehr (?) stechen sollte	Sieg 1955: 69
[This is] the remedy, a salve for whom the *terwe* bites.	Peyrot 2013: 704
[If] (the wound?) would bite the *terwe* of someone	CETOM
a salve for whose wound bites/stings/hurts	F.W., A.R.H.

of the word *terwe*, which appears twice in manuscript PK AS 3B, though the first attestation requires a conjecture. The sequence <rwe> at the beginning of line b1, as well as the subsequent occurrence of *ke* = *tsākaṃ sāṃtke*, which corresponds to the passage in Example (1), suggests that <te> has been cut off at the end of line a6 (cf. CETOM).

Regarding the interpretation of *terwe*, apart from Sieg (1955: 69), who interprets it as an adverb with the meaning "very, a lot *vel sim.*", indicating that the patient needs another or a different treatment, scholars generally read it as a noun. According to Peyrot (2013: 704) and Adams (DTB^2: 324), it constitutes the subject of *tsākaṃ* "bite/burn.SUBJ.3SG", but while Peyrot leaves the question open as to what it is that bites, Adams associates *terwe* with a type of snake. Blažek (2021: 117–8) takes up the idea of connecting Ancient Greek σαῦρος /saûros/ and σαύρα /saúra/ "lizard", seemingly from PIE *$t\underset{\circ}{u}r\underset{\circ}{u}o$-/$\underset{\circ}{e}_2$ [sic!], to TochB *terwe* (from a possible PIE *$tor\underset{\circ}{u}o$- < *$t\underset{\circ}{u}or\underset{\circ}{u}o$- with regressive dissimilation of the first *$\underset{\circ}{u}$). However, he deems this association unconvincing due to the Mycenaean evidence which, according to him, points to initial *s- rather than *$t\underset{\circ}{u}$-.

Another interpretation is given by CETOM in their translation of the passage at hand (reproduced in Table 1). The authors analyse *terwe* as the direct object of the verbal form *tsākaṃ* "bite/burn.SUBJ.3SG". As the subject, they identify *lope*, which precedes *terwe* in the text and is separated by a dot (Malzahn 2007: 254). TB *lope* is then interpreted as a borrowing from Sanskrit *lopa*- m. "hurting, breaking; violation" (MW: 904), and it is suggested that it might relate to a part of the skin. In Peyrot's (2013: 704) account mentioned above, *lope* is identified as a late TochB form of *laupe* "salve" with monophthongization of /au/ to /o/ (cf. also Sieg 1955: 69; DTB^2: 612, and the translation as "liniment" in Carling 2003: 83).

Considering the overall subject matter of the text, we believe that interpreting *terwe* as "a kind of snake" is not entirely convincing. Neither does the translation provided in CETOM seem felicitous, as it leaves the form *terwe* unexplained. We would therefore like to suggest a different interpretation, where *terwe* means "wound".

We suggest that *terwe* is linked to one of the PIE roots *$terh_1$- "drill, rub", *$terh_2$- "pass through, cross", or *$terh_3$- "wound" (LIV^2: 632–4). Of these three roots, which are often difficult to distinguish in the daughter languages, only *$terh_2$- seems to be otherwise attested in Tocharian. According to Pinault (1988: 200–1), it is continued in the TochB verb $^{?}tär^{\bar{a}}$- "±radiate; stretch, reach out" (cf. also Malzahn 2010: 655; DTB^2: s.v.), which is additionally attested as the hapax legomenon *cirār*.[11] Semantically, however, it is much more difficult to derive the meaning "wound" from "pass through, cross" than from the meanings of the other two roots. It is, of course, possible to assume that a wound is the result of something "passing through" or "crossing" the barrier of the skin. However, considering that such an interpretation does not seem to have any parallels in Indo-European with this root, we

[11] *cirār* is attested in PK NS 37 a1 in the phrase *po klokastanmeṃ cir(ā)r swañcaiṃ kälymi(ṃ)* "from all the pores rays crossed the directions" (CETOM).

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consider this explanation only weakly supported. We therefore suggest that TochB *terwe* is related either to PIE **terh₁-* or **terh₃-*. The fact that so far no continuants of these roots have been found in Tocharian is admittedly a disadvantage for either explanation. However, we believe that the semantic correspondence justifies the association of *terwe* with one of these roots (cf. also the Vedic adjective *turá-* "sore", see LIV²: 634 fn. 1 and Grassmann 1873: 542).

A problem for this explanation could be the missing reflex of the root-final laryngeal in *terwe*. In this position, the presence of a PIE laryngeal is reflected in TochB as *ā* if accented and *a* if unaccented (Hackstein 2017: 1316–17). However, considering the *o*-grade in the root of the supposed pre-form **torh₁/₃-u̯o-*, one could invoke the so-called "Saussure Effect" to account for the lack of a reflex of the laryngeal. The Saussure Effect describes the loss of laryngeals in the environment **#_Ro* and **oR_C*, where "R" stands for a resonant (cf. Nussbaum 1997, and see de Saussure 1905: 511 fn. 2 for the original observation). Thus, in the paradigmatic example of Greek τόρμος /tórmos/ "hole, socket; tenon" (LSJ⁹: s.v.) (< PIE **torh₁-mo-*) vs τέρετρον /téretron/ "borer, gimlet" (LSJ⁹: s.v.) (< PIE **terh₁-tro-*), the root-final **h₁* is reflected as /e/ except when originally preceded by a sequence **-or-*. As for Tocharian, there is at present no separate study dealing with the Saussure Effect. However, the operation of a rule **oRHC* > **oRC* is assumed by Hackstein (1995: 25–7). Accordingly, we suggest that the missing reflex of **h₁/₃* in TochB *terwe* could be explained by this rule.[12]

Regarding the function of the suffix **-u̯o-* in TochB *terwe*, our interpretation implies that it derives resultative nouns. Unfortunately, there is at present no study specifically dealing with this suffix in Tocharian, and discussing all derivatives in a suffix with initial *-w-* is beyond the scope of the present article. Therefore, we limit ourselves to providing two examples which seem to attest a resultative meaning for the TochB suffix *-we*. The first is TochB *ketwe* "ornament, jewel; jewellery". According to van Windekens (1976: 190) (and subsequently DTB²: 205), it is a derivative of the root *kät-* "strew, spread out" (< PIE **(s)kedh₂-* "zersplittern, zerstreuen", see LIV²: 550–1), while Hilmarsson (1996: 139) connects the TochB word with the PIE root **gʰedʰ-* "join" (LIV²: 195). Regardless of which etymology is correct, the derived noun has resultative semantics, explained as "something that is spread out" or "something that is joined" > "ornament, jewel; jewellery", although it is likely that the meaning "jewel; jewellery" has developed secondarily. The second example is TochB *weswe* "trace". It is analysed as a derivative of the root *wäs-* "abide, dwell, remain" (< PIE **h₂u̯es-* "dwell, pass the night") (cf. DTB²: 666; Malzahn 2010: 897–8; LIV²: 293–4). Likewise, a trace can be interpreted as the result or, rather, the vestigial imprint of abiding or dwelling at a certain place. Accordingly, the meaning of TochB *terwe* "wound" could be interpreted as expressing the result of "drilling, rubbing" or "wounding" depending on whether one would like to connect it to **terh₁-* or **terh₃-*.

As for the metaphorical meaning of "to bite/burn" (*tsākaṃ*), we believe that it could refer to either an itching, hurting, or stinging wound. For instance, in dialectal German, *es beißt mich* can mean "I'm itchy" (lit. "it bites me") and German *Wundfraß* (lit. "wound-eating") is another word for gangrene. Considering that it has been suggested that *kokne* in PK AS 3B a1 refers to gangrene, we believe that this translation is more convincing.

To sum up, we present the different interpretations of the passage (*lope) • terwe ke= tsākaṃ-ne sātke* together with our own reading in Table 1. If our interpretation is correct, the overall structure of the manuscript can be represented as follows: (1) Mention of a wound as the ailment (a1); (2) remedies (a2–a6); (3) mention of the conditions *terwe* and itching

[12] For a critical stance on the Saussure Effect, see Pronk (2011).

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with a remedy listed without *läksañña klautso* (b1–b2); (4) mention of the conditions *terwe* and itching with a remedy listed with *läksañña klautso* (b2–b3).[13]

2.2. *IOL Toch 306*

IOL Toch 306 was first published by Couvreur (1955) and most recently discussed by Carling (2003).[14] This medical document deals with two types of cancer, one due to gall and the other to phlegm (Carling 2003: 75–6). It also follows the disease-oriented scheme as presented in the previous section by introducing the disease first and then providing its remedy (*ñake sāṃtke weñau* "now I shall state the remedy", cf. Peyrot 2013: 656). At the end of the description of the remedy, the author summarizes how to use the medicine (*toy prayokänta malkwersa yokalyi kwärmatse sāṃtke* "these remedies are to be drunk with milk as a medicine against cancer").[15]

The back side of IOL Toch 306 is cut off on the right-hand side. In IOL Toch 306 b1, the only legible part is *läksaiñ[ai] – tsai ṣṣe –*, before the manuscript abruptly ends. Thus, by means of comparison, *läksaiñai*[16] *klautsaiṣṣe ṣpel* was reconstructed as a reading in accord with *läksañnai klautsaiṣṣe ṣpel* in PK AS 3B (Carling 2003: 83). According to Huard (2022: 432), the fact that *ṣpel* in the context of this prescription is to be drunk with milk (see above) is further evidence for reading this word as "powder".[17]

To summarize this section, the syntagma *läksañña klautso* appears in two TochB medical manuscripts as an ingredient for concoctions intended to aid the healing of wounds (PK AS 3B) and treating of certain types of cancer (IOL Toch 306).

3. The morphology and morphosyntax of *läksaña klautso* and *läksañnai klautsaiṣṣe*

In this section, we analyse the morphology and morphosyntax of the syntagma *läksañña klautso* and its corresponding adjective phrase *läksañnai klautsaiṣṣe* against the background of the etymology of their components. TochB *klautso* "ear(F)" is attested in the singular form and also in the dual as *klautsane*.[18] It is derived from the PIE root **ḱleu̯-* "hear" (LIV^2: 334–5) by means of the suffix **-ti-*, as it also appears in Indo-Iranian derivatives of the same root, e.g. Vedic *śrúti-* "hearing(F)" and the Young Avestan compound *fra-srūiti-* "recital(F)" (e.g. EWAia II: 666; NIL: 425).[19] However, because the *o*-grade of the root is unexpected in *ti*-stems, i.e. **ḱlou̯-ti-*, *klautso* most probably presents a more recent formation (NIL: 432 fn. 56). For further details on the stem-formation as well as a discussion of the origin of the stem-final affricate *ts* we refer readers to Hilmarsson (1989: 102–3 with reference to Pedersen 1941: 74) and Del Tomba 2023: 141, fn. 207.

[13] According to Sieg (1955: 68), a new paragraph begins with *dvavraṇi* (incorrect for *dvivraṇi*) which is a compound with the second compound member being *vraṇa-* "wound, sore, ulcer, abscess, tumour, cancer, boil, scar, cicatrix, crack" (MW: 1042).

[14] For further works addressing IOL Toch 306, see Carling 2003: 75 fn. 2.

[15] Text and translation here are adapted from CEToM.

[16] The occurrence of *-aiñ-* rather than the expected *-añ-* can be attributed to a modified version of Pinault's law, as demonstrated in Del Tomba 2023: 158.

[17] Note that PK AS 3B contains a clear instance of *ṣpel* in the syntagma *panitäṣṣe ṣpel* "molasses powder" appearing on the same line and in the same prescription as the conjectured *läksañnai klautsaiṣṣe ṣpel* (cf. CEToM, where *ṣpel* is, however, translated as "pill").

[18] The TochA cognates are *klots* "ear" in the singular and *klośäṃ* in the dual.

[19] The *ti*-stem apparently replaced the PIE word for "ear", in Tocharian, i.e. **h₂e/ou̯s-os-* (see NIL: 339–43).

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TochB *klautsaiṣṣe* constitutes a relational adjective derived from *klautso* by means of the suffix *-ṣṣe*. Similar to *-ñňe* (see below), this suffix has genitival semantics and denotes appurtenance in a broad sense (cf. Fellner 2013: 59). Adjectives derived with *-ṣṣe-* are frequently material adjectives and adjectives designating origin or descent, cf. *or* "wood" → TochB *oraṣṣe* "of wood", the TochB personal name *Kāś* "Kāśi" → *kāśiṣṣe* "of Kāśi" (Zimmer 1983). As a pre-stage of the suffix *-ṣṣe-*, either or both of **-si̯o-* or **-sii̯o-* have been proposed (cf. TEB I: 145; Ringe 1996: 117; Pinault 2008: 515). Arguing that PT coronals are palatalized before the high front vowel **i*, but not before the glide **i̯*,[20] Fellner (2013: 50) opts for **-sii̯o-* as the Proto-Tocharian preform of the suffix. Because evidence for the PIE suffixes **-sii̯o-* and *-so-* is scarce, Fellner (2013: 63) follows Jasanoff (1989: 140) in tracing the suffix back to **-sk̂ii̯o-*. A cognate suffix can be found in Armenian *-c^{c}i-*, which derives relational adjectives (see Pedersen 1924: 225). The suffix **-sk̂ii̯o-* can be further analysed as a combination of the suffixes **-sk̂o-* (Germanic **-iska-*, Lithuanian *-išk-* and Old Church Slavonic *-ьsk-*, and Greek *-ισκο- /-isko-/*) and **-ii̯o-* (Old Church Slavonic *-ii* < **-ьjь*). Both of these suffixes, in principle, derive genitival adjectives. Therefore, Fellner (2013: 65) suggests that "**-sk̂ii̯o-* found in Tocharian and Armenian is a recharacterised version of **-sk̂o-* with **-ii̯o-* to mark it specifically as an adjective of appurtenance (or an adjectival derivative of a substantivised adjective in **-sk̂o-*)".

On purely formal grounds, the inflectional form *-ṣṣe* could either represent the masculine form of the nominative or the oblique cases in the singular. In PK AS 3B b2–b3, *klautsaiṣṣe* must be identified as a nominative form because it constitutes an attribute of *ṣpel* "powder.NOM.SG(M)" (Adams 2015: 66).

The second element of the phrase of interest is *läksaññа*. It represents a derivative of TochB *laks* "fish" (with the plural *läkṣī*), which is traditionally assumed to be cognate with the word for "salmon" in other Indo-European languages, e.g. Old High German *lahs* "salmon" (cf. AWB: s.v.), Old Lithuanian *lãšišas* "salmon" and Russian *losos'* "salmon" (cf. DTB^{2}: 590 s.v. *laks*; ALEW^{2}: s.v. *lãšišas*).[21] However, this connection is problematic mainly because of the differences in the root vocalism between the Tocharian and the other Indo-European cognates: while TochB *laks* points to an original **u* in the root, the Germanic, Baltic, and Slavic words require PIE **o* or **a*. Researchers have tried to reconcile these discrepancies by assuming an originally apophonic paradigm or a loan from another Indo-European language (e.g. Adams 2015: 177, resp. Ringe 1996: 92). Criticizing these explanations as *ad hoc*, Pinault (2009: 241 with fn. 74) proposes an alternative etymology. According to him, TochB *laks* goes back to a PIE *i*-stem **luks-i-* "white, shining", derived from an extended form of the PIE root **leu̯k-* "white". As for the semantics, Pinault assumes that they relate to the characteristics of the flesh or body of fish "as opposed to the bloody flesh of other edible animals". Accordingly, the white/shining body or flesh of a fish is suitably captured by the proposed semantics, especially seen under water. Pinault does not provide further information about the involved derivational patterns nor the semantic development but refers to the two nouns, Greek λεῦκος /leûkos/ "name of an unknown fish" and Old Icelandic *lýr* "gadus pollachium", which are both derived from the same root **leu̯k-* "white". The latter shows that the root at hand appears in designations for specific kinds of fish, but it does not attest its usage in the generic term for fish. Accordingly, Pinault's proposal would gain strength if it could be shown that the general term for "fish" can be based

[20] Cf. Bateman 2011: 597 on the different abilities of **i* and **i̯* to palatalize adjacent consonants and see Wandl 2020: 83 for an example from Slavic.

[21] Whether Ossetic *лæсæг* "brown trout" also belongs here is disputed. Most recently, Procaccino (2025) has argued that it rather constitutes a genuine Ossetic formation.

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on a root with the meaning "white" or "light", be it as an original derivation or due to a *pars pro toto* generalization. As for the derivational pattern, one could assume that pre-Tocharian **luks-i-* constitutes an *i*-substantivization of an adjective **lukso-* (on the mechanism, see Schindler 1980 and Balles 2009). The latter could be a thematic possessive derivation of a neuter *s*-stem **leu̯k-os-*, as attested in Old and Young Avestan *raočah-* "light(N)" (AIW: 1489; EWAia II: 464). Be this as it may, **leu̯kso-* is the pre-form of Icelandic *lýr* "gadus pollachium" (Magnússon 1989: s.v. [1]*lýr*).

Turning back to PToch **luksi-*, the proposed scenario would start from an adjective **lukso-* with the meaning "white, light, shiny". From this adjective, a noun could be derived by means of *i*-substantivization, which basically consists of transforming the thematic stem into an *i*-stem by means of substitution. The result would be an abstract noun **luksi-* with the meaning "whiteness, brightness, shininess". As is the case with many abstract nouns, **luksi-* would then have further developed a more concrete meaning as "the white/light/shiny one", which would then have been applied to either a specific type of fish or to fish in general.

Considering that the above scenario is far from trivial – multiple unattested intermediate steps have to be assumed – we believe that a link between TochB *laks* and the Germanic, Baltic, and Slavic words cannot be rejected outright. It is hoped that a future study dedicated to TochB *laks*, and taking into account all possible scenarios, will clarify its origin.

The suffix *-ññe-*, used here to derive the adjective *läksaññe* by attaching to *laks* extended by the linking vowel *-a/ä-*, forms secondary relational adjectives with genitival semantics (cf. Fellner 2013: 46). According to Fellner (2013: 45–6), adjectives of this type denote appurtenance (e.g. TochB *ost* "house" → *ostaññe* "domestic, resident"). Accordingly, TochB *läksaña* translates as "relating to fish" (TEB I: 214, 218).

The Proto-Tocharian form of the suffix is thought to be either **-ni̯o-* (cf. TEB I: 146) or **-nii̯o-* (cf. Ringe 1996: 117), or both (cf. Pinault 2008: 515). For the same reasons as the above-discussed suffix *-ṣṣe-*, Fellner (2013: 50) takes **-nii̯o-* as the PT form. This suffix is further analysed as a combination of the Proto-Indo-European adjectival suffixes **-no-* and **-i̯i̯o-*.

The grammatical agreement in the syntagma *läksaññai klautsaiṣṣe ṣpel* is of special interest. Contrary to what one might expect, the adjective *läksaññai* does not agree with the nominal head of the phrase (*ṣpel*), in the same way as NOM.SG.M *klautsaiṣṣe*. Instead, the inflectional ending OBL.SG.F *-ññai*, which goes back to PT **-ñäyā* (see Fellner 2013: 56), shows gender agreement with the feminine *klautso* "ear", which itself forms the derivational basis of *klautsaiṣṣe* (see above in this section). The oblique case form, on the other hand, seems to be induced by the function of the relational adjective *läksaññai*, which is similar to that of a genitive case (see Example 3). Adams (2015: 66–7) refers to this pattern as "adjectival agreement with a 'submerged' genitive" (see there further examples from TochB).

(3)	*läksaññai*	*klautsaiṣṣe*	*ṣpel*
	of.fish.OBL.F.SG	of.ear.NOM.SG.M	powder.NOM.SG(M)
	"fish-ear powder" = "powder made from conches/shells"		

The structure of the TochB noun phrase in Example (3) is reminiscent of a pattern found in Upper Sorbian, a West Slavic language spoken in eastern Germany (Corbett 1987). In Example (4a), the possessive adjective *mojeho* shows gender agreement with *brat* "brother", which serves as the derivational basis of the possessive adjective *bratrowe* "brother's.NOM.PL". At the same time, *mojeho* takes the genitive singular ending, which is in

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accordance with the function of the possessive adjective, as can be seen from the synonymy of the two noun phrases in (4a) and (4b) (Corbett 1987: 300).

(4)

a.	*mojeho*	*bratrowe*	*dźěćі*	
	my.GEN.SG.M	of.brother.NOM.PL	child.NOM.PL	
	"my brother's children"			(Michałk 1974: 510)
b.	*dźěćі*	*mojeho*	*bratra*	
	child.NOM.PL	my.GEN.SG.M	brother.GEN.SG(M)	
	"the children of my brother"			

Thus, while the morphology and morphosyntax of the noun phrase *läksaññа klautso* and the derived *läksaññai klautsaiṣṣe* are relatively straightforward, its meaning, in our opinion, has not yet been convincingly explained. The following section provides evidence supporting our claim, which states that "fish ear" should be read as "conch, shell".

4. Towards a new interpretation

As stated in the introduction (Section 1), we believe that the previous reading of *läksaññа klautso* as "gill" is unconvincing and instead suggest that it should be interpreted as referring to a conch or shell. To substantiate our claim, in this section we discuss evidence for the syntagma "fish ear" to denote "shell" throughout various Nakh-Dagestanian languages (Section 4.1), metaphoric associations in modern languages (Section 4.2), and the usage of shells and conches in Āyurvedic and traditional Chinese medicine, whose medical practices were in use by speaker communities in contact with Tocharian speakers (Section 4.3). Though we cannot disprove the previous reading as "fish gill", we believe that the combined evidence presented in the following sections strongly supports our interpretation.

4.1. Nakh-Dagestanian languages

In several Nakh-Dagestanian languages (also known as Northeast Caucasian languages), a syntagma consisting of the words "fish" and "ear" is used to designate shells or conches. We believe that this is a non-trivial correspondence with the TochB syntagma discussed above.

In Avar, "conch" and "shell" are known by the compound *ччуɛIиɛIин* /č:uʕiʕin/. This compound can be segmented as consisting of a first compound element *ччуɛIа* /č:uʕi/ "fish" and a second compound element *ɛIин* /ʕin/ "ear". Accordingly, the literal translation of this compound is "fish ear".

If further analysed, the Avar noun can be identified as belonging to a class of compounds that go back to phrases consisting of a genitive attribute and a noun (Alekseev et al. 2012: 110). In fact, Khalilov in IDS mentions the non-compounded form *ччуɛIил ɛIин* /č:uʕil ʕin/ as the Avar designation of "conch, shell" (Example 5).

(5)

č:uʕil	ʕin	(Avar)
fish.GEN.SG	ear.ABS.SG	
"conch, shell"		

Parallel noun phrases in other Nakh-Dagestanian languages meaning "conch, shell" are found in Aghul, Andi, Akhvakh, Archi, Bezhta, Hinuq, Hunzib, Karata, Khinalug, Khvarshi, Lezgian, and Tsez. Interestingly, the two components of the noun phrases are not cognates

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in all cases. For instance, in Example (6), four non-cognate words for "fish" are used.[22] Thus, tracing back the meaning of "shell" to one syntagma in the proto-language does not seem to be straightforward.

(6)

a.	хIабхиIлин	ой	[нabχiˤlin oj] (Archi)
	fish.GEN.SG	ear.ABS.SG	
b.	бисалис	аь^{H}гъаь	[basalis ãʁ̄ã] (Bezhta)
	fish.GEN.SG	ear.ABS.SG	
c.	гъедин	йаб	[ʁedin jab] (Lezgian)
	fish.GEN.SG	ear.ABS.SG	
d.	чугIилIи	гьа^{H}де	[c̄uʕiX̄i ha^{n}de] (Akhvakj, Northern Dialect)
	fish.GEN.SG	ear.ABS.SG	

Considering the distribution of this syntagma across numerous Nakh-Dagestanian languages, it may be assumed that a proto-syntagma consisting of the words for "fish" and "ear" existed at an earlier stage of the language family. This proto-syntagma would then have been modified in the languages individually due to lexical changes affecting either component of the syntagma. On the other hand, one could also assume that the syntagma originated in one language and spread as a result of subsequent loan translations. In this case, one could further ask whether the syntagma has been borrowed into Nakh-Dagestanian from a non-Nakh-Dagestanian language. This question is most interesting because it might provide a link between the evidence from TochB and that from Nakh-Dagestanian. Since the Caucasus was connected to the trading networks associated with the so-called Silk Road, albeit by minor and local routes,[23] it is possible that the designation for "conch, shell" entered the Nakh-Dagestanian languages as a calque through trade. Perhaps conches or shells were even traded as medicinal goods (cf. Section 4.3).[24] Unfortunately, we have so far been unable to find a parallel expression for "conch, shell" in a language that could have served either as the donor or the mediator of the expression.[25] Therefore, the assumption of a loan is currently not supported by any evidence, and we should rather reckon with parallel formations in Nakh-Dagestanian and Tocharian. As for the origin of the Nakh-Dagestanian expression, it would thus seem reasonable to assume that it stems from a language with supra-regional relevance. Considering its former status as a *lingua franca* of the region, a suitable candidate could be Avar. However, a detailed etymological investigation of the syntagma requires a separate study as this paper is interested in the Nakh-Dagestanian evidence merely as a parallel to the proposed TochB reading.

[22] Data and transcriptions are taken from IDS.

[23] According to Avdaliani (2025a: 28), in late antiquity, a vast network of small and medium trade routes linked the Caucasus to both Byzantium and Iran. Notably, in the sixth century, the Eastern Roman Empire had an interest in developing trade relations with Turks and Sogdians via the Caucasus to maintain silk imports during the Sasanians' blocking of more traditional routes. Evidence for these trade routes is provided by archaeological findings, which include silk artefacts from the sixth and seventh centuries (Avdaliani 2025a, 2025b).

[24] Shells from the Indian Ocean have been found by archaeologists, e.g. in the Baltics, which could be indicative of shells being transported and traded along the Silk Road (Knutson 2020: 629).

[25] It can be noted that, in Modern Turkish *dev kulağı* "queen conch" is attested where *dev* "giant" and *kulak* "ear" form a compound.

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4.2. Metaphoric associations

Apart from parallels consisting of a word for "fish" and "ear", in Nakh-Dagestanian, we also find expressions that contain the word for "ear" together with other determiners. Moreover, in Udi, the same word is used for "ear", "earlobe", and "shell" (cf. Udi *уъмуъх* /uˤmuˤx/ "ear, earlobe; shell" (IDS)). This clearly shows the association drawn by the speakers between ears and conches due to their similar shape. The same association is also evident in many other languages. For instance, the taxonomic term for abalones, a type of sea snail with an ear-shaped shell, is *haliotis*, a bookish formation consisting of the Ancient Greek words ἅλιος /hálios/ "of the sea, of sea-gods, nymphs, etc." (LSJ[9]: s.v.) and οὖς /oûs/ "ear" (Ionic and Attic Greek) (GEW II: 448–9; LSJ[9]: s.v.).[26]

An exact correspondence is found in German *Seeohr* "abalone" and *Meerohr* "id." (DWDS: s.vv.). Although the German terms most probably simply present translations of the term *haliotis*, the latter, as well as the alternative English name *ear shells*, clearly proves the metaphorical use of "ear" in the name of abalones. Another example of the word "ear" occurring in the name of a mussel is the English name *elephant-ear* used for *Elliptio crassidens*, a type of freshwater mussel.

However, not only do we find ears in mussels but also mussels in ears. For instance, the German word for the human auricle is the compound *Ohrmuschel*, which consists of the words *Ohr* "ear" and *Muschel* "mussel". In this compound, the latter word has the meaning "conch, shell". Similarly, in Hungarian, the auricle is called *fülkagyló*, a compound of *fül* "ear" and *kagyló* "shell" and, in Russian, *ушная раковина/ušnaja rakovina* "auricle" is formed by a noun phrase consisting of the adjective *ушная* "of.ear" and *раковина* "shell".

At the beginning of this Section (4), we stated that the correspondence between the TochB expressions under scrutiny and the above-discussed Nakh Dagestanian words is, in our opinion, non-trivial. However, this characterization holds only with regard to their semantic derivation, i.e. as evidence demonstrating that syntagmata and compounds consisting of the components "fish" and "ear" can have the meaning "conch, shell". The evidence discussed in this section, on the other hand, shows that the metaphorical association of "ear" and "conch, shell" is common and, accordingly, to some extent trivial indeed. Therefore, the appearance of the word "ear" in the TochB word for "conch, shell" does not come as a surprise.

4.3. Shells and conches in (traditional) Indian and Chinese medicine

At present, original or parallel texts of the above-discussed TochB medical prescriptions (Section 2) in the Sanskrit medical canon have not yet been identified. As stated by Huard (2022: 432), neither in the *Carakasaṃhitā*, the *Suśrutasaṃhitā* nor in the *Siddhasāra of Ravigupta* do we find corresponding passages. Accordingly, in our interpretation of the TochB content, we cannot rely on resources of this type. To strengthen our argument, in this section we point the reader to the usage of conches and shells in Āyurvedic (4.3.1) and traditional Chinese medicine (4.3.2), which constitute the most influential medical traditions of the region.[27] They at least show that conches and shells were regularly applied as part of medical treatments, while the same has not been demonstrated for gills.[28]

[26] A term such as *haliotis* is, however, not found in classical Greek sources and seems to be a rather modern construction.

[27] However, note that, as has been pointed out to us in a personal comment by Samira Müller, the presence of cow dung in PK AS 3B could point to an Āyurvedic original.

[28] It is important to note that various types of shells are used as medicinal ingredients in other medical traditions outside the region discussed. For instance, in Spanish ethnomedicine, shells have been employed to treat dermatological and gastrointestinal conditions (González and Vallejo 2023: §§2.2.2, 3.2).

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The presence of shells in evidence-based medicine is minuscule, to say the least. However, their main component, calcium carbonate ($CaCO_3$), is, of course, used in medical contexts. The study of the effectiveness and roles of calcium and calcium carbonate in wound healing is still a matter of debate (cf. e.g. Muleta Andrade et al. 2018; Subramaniam et al. 2021; Wang et al. 2023). In contrast, the use of calcium carbonate is well known and established as an antacid by both raising the pH of stomach acid and inducing peristasis of the oesophagus (Al Omari et al. 2016: 6; Garg, Narang and Taneja 2022: 12) and is thus relevant for gastrointestinal ailments (see e.g. IOL Toch 306 *supra*).

4.3.1. Āyurvedic medicine

In the Āyurvedic tradition, the use of *śaṅkha-* "shell, conch-shell" is already attested in the Atharvaveda as *śaṅkhá-* "shell(M)".[29] The context in which this word occurs (see e.g. AV 4.25.1) is not of a medicinal nature, however. Within the later Āyurvedic tradition, one of two groups of influential medical texts is of special relevance to the first millennium CE, this being the *bṛhattrayī*, containing the *Carakasaṃhitā* (Sharma 1998), the *Suśrutasaṃhitā* (Wujastyk 1998), and the *Aṣṭāṅgahṛdayasaṃhitā* (Hilgenberg and Kirfel 1941, Wujastyk 2015: 1043 fn. 1). Another influential medical text of the time that could have been known to Tocharian scribes is the *Siddhasāra of Ravigupta* (Emmerick 1980, 1982). In this section, we provide evidence for the use of conches in these four texts.

In the *bṛhattrayī* and the *Siddhasāra of Ravigupta*, conches and shells are mentioned as an ingredient for a variety of drugs to cure various ailments. Of these, we consider the following as noteworthy with regard to the Tocharian manuscripts discussed in this paper:

- Ailments pertaining to the skin, e.g. erysipelas and leprosy: Sharma 1998: 352; Hilgenberg and Kirfel 1941: 468.
- (Internal) haemorrhage: Sharma 1998: 93, 96, 330; Wujastyk 1998: 159; Emmerick 1980 164–165, §7.30.
- Diarrhoea: Sharma 1998: 643; Hilgenberg and Kirfel 1941: 386.

The application of conch/shell powder in the treatment of ailments pertaining to the skin is interesting with regard to our interpretation of PK AS 3B b2–b4 as a treatment of wounds because it confirms external use of the pharmaceutical. Its use in the treatment of open wounds is then confirmed by the prescriptions dealing with haemorrhages. In this regard, it is worth pointing out that, in a prescription meant to curb excessive blood flow from bloodletting (Wujastyk 1998: 159), conch-shells are used together with, among other ingredients, lodh tree (powder), which is also mentioned in PK AS 3B a5. Moreover, in a prescription concerned with the stopping of nosebleeds, conch-shells are, among other ingredients, used together with *gairika-* (translated as "red ochre" by Emmerick 1980: 164–5, §7.30), as it occurs in PK AS 3B b3. Intake of conches/shells in the treatment of a gastrointestinal ailment, on the other hand, is of interest with regard to IOL Toch 306.

An ingredient derived from *śaṅkha-* that remained known until modern times in Āyurvedic medicine is *śaṅkhabhasman-* "the ashes of a burnt shell", a *tatpuruṣa* compound (MW: 1047).[30] In Āyurvedic medicine, it belongs to the Rasaśāstra, i.e. the branch of pharmaceuticals dealing with the preparation of medicine from metals and minerals. *Śaṅkhabhasma* "is prepared by soaking the shell in lime and calcining in covered crucibles

[29] On the etymology of *śaṅkhá-* "shell(M)" and its relation to Ancient Greek κόγχος /kóŋkʰos/ "mussel; cockle(M/F)" and κόγχη /kóŋkʰē/ "id.(F)" (LSJ[9]: s.vv.) through a PIE **ḱonkh₂o-* or **ḱonkʰo-*, see EWAia II: 604. The lexeme *śaṅkha-* is also found as a borrowed term in TochA texts, cf. e.g. *wisṇuy śaṅk maṅkal* (A355 a4) and *viṣṇuy śaṅk maṅkal* (A356 a1), when denoting the auspicious sign (Carling and Pinault 2023: s.v. *maṅkal*) of Viṣṇu.

[30] This ingredient is already mentioned, for instance, in the *Carakasaṃhitā* (cf. Sharma 1998: 31 CS 1.4.22).

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ten to twelve times and finally reducing it to powder (ash)" (IMM: 165). As for the medical effect of *Śaṅkhabhasma*, the *Indian Materia Medica* describes it as anodyne, carminative, digestive, and astringent (IMM: 165). In general, its properties are those of an alkaline remedy (cf. e.g. Bhishagratna 1963: vol. 2, 448–9). It is used to treat earaches, ulcers, and eye troubles, and is also used internally to treat dysentery, gonorrhoea, colic, dyspepsia, and jaundice. Moreover, it is mixed with other ingredients to produce compound powders or pills, which are mostly used to treat ailments related to the gastrointestinal tract, but also catarrh, sore throat, cough, asthma, and others. Notably, together with whey, it is used to treat tympanitis, flatulence, colic, and other conditions. A cooling effect has also been described (Chavan et al. 2018).

To sum up, traditional Indian medicine provides ample evidence for the use of conches/shells. Regarding the applications described in the Tocharian manuscripts discussed in this paper, it is interesting to note that they are used in the form of a powder, similar to *läksaññä klautso*. Furthermore, conches/shells are applied both externally and internally, corresponding to the usage of *läksaññä klautso* in the treatment of wounds and of gastrointestinal ailments. Of further interest is that the conch/shell powder is taken together with dairy to treat ailments related to the gastrointestinal tract, as we may recall from IOL Toch 306, where *läksaññä-klautso*-powder is to be drunk with milk as a treatment for cancer. Finally, we have identified other ingredients from the Tocharian manuscripts discussed above that also appear together with conches/shells in the Sanskrit literature. Thus, while identifying an Āyurvedic antigraph of the Tocharian manuscripts must – if it exists – remain a task for the future, the use of conches/shells in the form of a powder was well known in the medical tradition of the time.

4.3.2. Traditional Chinese medicine

Conches are also found among the pharmaceuticals used in traditional Chinese medicine. They appear in one of the oldest and most fundamental Chinese medicinal texts, the *Shénnóng Běncǎo Jīng* (神農本草經), translated as "The Divine Farmer's Materia Medica" (Yang 1998, and, with further details on the translation of the title, Unschuld 1986: 14). According to the Daoist physician T'ao Hung-ching (陶弘景) (456–536 AD), the *Shénnóng Běncǎo Jīng* was first written down during the Eastern Han dynasty (*c.* 200 AD), after having been transmitted orally for centuries (cf. Unschuld 1986: 17; Yang 1998: iii). The two passages in Examples (7–8) make mention of the healing and health properties of certain shells.

(7) ***Mu Li* (Concha Ostreae)** [i.e. *mǔ lì* 牡蠣] is salty and balanced. It mainly treats cold damage, cold and heat, warm malaria with chills, and fright, indignation and anger qi.[31] It eliminates tuggings and slackenings, mouse fistulas, and, in females, red and white vaginal discharge. Protracted taking may fortify the bone joints, kill evil ghosts, and prolong life. Its other name is *Li He* (Oyster Shell). It grows in pools and swamps (cited from Yang 1998: 117).

[31] The concept of *qi* is notoriously difficult to grasp. It is commonly translated as "breath" or "(vital) energy", but according to Stanley-Baker (2022: 23), the single character alone has up to thirty-five different definitions in modern dictionaries. In the description at hand, *qi* is extended to the emotion anger, which, if not released, causes bodily harm (Stanley-Baker 2022: 23). In Yang 1998, the term *qi* is defined as one of two features pharmaceuticals can have: one being flavours (sour, salty, sweet, bitter, and acrid) and the other being *qi* or natures (cold, hot, warm, cool) (Yang 1998: xii fn. 13). This definition, however, does not clarify the concept the author is translating as "anger qi" unless one takes the definition by Stanley-Baker (2022: 23) into account.

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(8) ***Hai Ge* (Concha Cyclinae Sinensis)** [i.e. *hǎi gé fěn* 海蛤粉] is bitter and balanced. It mainly treats cough and counterflow qi ascent, panting, vexatious fullness, chest pain, and cold and heat. Its other name is *Kui Ge* (Bulky Shell). It grows in pools and swamps. *Wen Ge* (Concha Cythircae Meretricis) mainly treats malign sores and the five [kinds of] eroding hemorrhoids (cited from Yang 1998: 124–5).

That we are dealing with a powder is clear from a comment made by the editor of the text on the entry about *Concha Cyclinae Sinensis* (Example 8). It states that the current name of this pharmaceutical is Clam Shell Powder and adds that it has the same effects as oyster shell (Yang 1998: 124 fn. 339).

The medicinal properties of powder from various types of shells are also discussed in the *Běncǎo Gāngmù* (本草綱目), the sixteenth-century *Materia Medica* by Li Shizhen (1518–93). This work also gives instruction on how the powder is recovered from different species of clams and snails (Li 2021: 861–948). In most cases, it involves burning and calcinating the shells, reminiscent of the production of *Śaṅkhabhasma* in Āyurvedic medicine. Like the latter, it is usually applied mixed together with other pharmaceuticals and also appears in pills. The medical effects of shell powder that are most interesting against the background of the TochB prescriptions discussed in this paper are those relating to sores and ailments of the abdomen.

While it is beyond the scope of this article to provide a detailed discussion of the different applications of shell powder in traditional Indian and Chinese medicine, we hope to have shown that it is a common pharmaceutical in these two traditions and that it is, moreover, used in contexts that bear some resemblance to those evoked in the TochB manuscripts. Additionally, it is interesting, although perhaps not surprising, to note that shells appear as pharmaceuticals in other traditions, too. For instance, several Ancient and Byzantine Greek authors, among them Hippocrates, Dioscurides, and Galen, mention the positive effect of burned and pulverised shells as well as the ashes of burned shells for sore and wound healing (cf. the overview given in Voultsiadou 2010). The Phoenicians and peoples of Central America are similarly known to use *Muricidae*, and modern-day research has demonstrated that multiple compounds of the *Muricidae*, not just from the shell, have anti-inflammatory, wound healing, and cancer-combatting features (Benkendorff et al. 2015: 5245–50). Benkendorff et al. (2015: 5261–63) summarize the uses of the *Muricidae* and, among the many ailments and remedies associated with them, are stomach pain, stomach and duodenal ulcers, gastric hyperacidity, swelling, and ulcers on the body surface (cf. further Voultsiadou 2010).

Before concluding, it is necessary to mention that we have also encountered one instance of fish gills being used in a medical context. The *Běncǎo Gāngmù* mentions the gills of long-finned herrings in a prescription against malaria (Li 2021: 668). Here, a section of the gills is added into a specific decoction made from seven ingredients and is further prepared with a mixture of water and wine. The mode of application is ingestion. Considering the differences in the medicinal context between this prescription and the prescriptions in the above-discussed TochB manuscripts, as well as the scarcity with which fish gills are mentioned in medical texts compared to shell powder, we believe it is unlikely that TochB *läksaññä klautso* is to be translated as "fish gill".

5. Conclusion

In conclusion, we suggest interpreting the TochB syntagma *läksaññä klautso* as "shell, conch" rather than "fish-gill" when considering its role as an ingredient in remedies for

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wounds and digestive issues.[32] This interpretation is supported by evidence from Tocharian manuscripts PK AS 3B and Toch 306, particularly if TochB *terwe* meant "wound", as suggested in this paper. Additionally, parallels can be found in various Nakh-Dagestanian languages, especially Avar, where a combination of terms for "fish" and "ear" refers to "shell" rather than to "fish-gill". Modern languages, including English and modern German, also use compound names incorporating "ear" for abalones.

As for the use of "conches, shells" in texts describing Āyurvedic and traditional Chinese medicine, we have not encountered an exact parallel to the proposed reading of the TochB text. However, the use of conches and shells in traditional medicine is well-attested. Most notably, the powder or ashes of different shells are used to treat wounds, sores, and ailments of the gastrointestinal tract. With regard to the difference between *läksaña klautso* (PK AS 3B a6) and *läksañ̃ai klautsaiṣṣe ṣpel* (PK AS 3B b2), we believe that, in the context of the prescriptions, they refer to the same ingredient. Considering that *läksañ̃a klautso*, together with the other ingredients, is to be strewn over the wound, it is best understood as a powder or something similarly fine-grained. Accordingly, it could be that *läksañ̃a klautso* was usually administered in the form of a powder, which is why the author of the manuscript did not consider it necessary to state this on every occasion. On the other hand, one could perhaps assume that it forms some kind of apposition with *ṣpel* in the noun phrase *kewiye melteṣṣe ṣpel*. Be this as it may, the described manner of administering *läksañ̃a klautso* clearly points to a powder of some sort. Therefore, we suggest translating the two passages given in Examples (1) and (2) as in (9a) and (9b).

(9)

a. *śabaralodrä • uppäläṣṣana piltāsa • dhanyamāṣ ||| (a)- | śvakate •* ***läksaña klautso*** *• kewiye melteṣṣe ṣpel te śār kätnälle kampāsäṣṣe śwelesa śanmäṣälle* [...] (PK AS 3B a5–a6, as in CEToM, modified)
"Symplocos racemosa, lotus leaves, a *dhānyamāṣa* (of?) Withania somnifera, **shell (powder)**, cow dung powder: this [must] be strewn thereover [and] be bound with a bandage...".

b. *terwe ke= tsākaṃ-ne sātke • || kewiye melteṣṣe ṣpel* ***läksañ̃ai klautsaiṣṣe ṣpel*** */// ṣpel gairikäṣṣe ṣpel te śār kätnälle epe no kroścana tonak śār lupṣallona toṃ prayokänta y(amaṣṣällona) /// dvivräṇikalp yasarsa saitsi śpālmeṃ*. (PK AS 3B b2–b4, as in CEToM)
"Whose wound stings them, [this is the] remedy: cow dung powder, **shell powder**, [...] powder, yellow arsenic powder: this [must] be strewn thereover or, however, these [must] be smeared thereover cold. These treatments have (to be made as) a *dvivraṇīya* cure. [It is to be used] with blood to staunch [it] perfectly."

Accordingly, the same syntagma *läksaiñai klautsaiṣṣe ṣpel* in the manuscript IOL Toch 306 should also be read as "shell/conch powder". Considering the combined evidence, we believe this reading is more convincing than the previous reading of *läksaña klautso* as "fish-gill".

[32] After we had finished the final version of this article, Athanaric Huard kindly informed us that a parallel phrase also exists in Khotanese. According to Emmerick, Khotanese *kava hīvī gū* "fish ear" designates shell and is seemingly also used as a plant name (Emmerick and Skjærvø 1982: 38–9). Considering the influence of Khotanese on the Tocharian materia medica, Huard suggests that the TochB *läksañ̃a klautso* could represent a calque from Khotanese. We believe that this is a highly interesting observation that should be considered in future research.

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Abbreviations

Languages and grammar

IE	Indo-European
PIE	Proto-Indo-European
PT	Proto-Tocharian
TochA	Tocharian A
TochB	Tocharian B
ABS	absolutive
GEN	genitive
F	feminine
M	masculine
OBL	obliquus
NOM	nominative
PL	plural
SG	singular
ADJ	adjective
LOC	locative

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ALEW^{2}	Wolfgang Hock et al. (eds). 2020–. *Altlitauisches etymologisches Wörterbuch*. https://alew.hu-berlin.de.
AWB	Elisabeth Karg-Gasterstädt and Theodor Frings (eds). 1952–. *Althochdeutsches Wörterbuch: Auf Grund der von Elias v. Steinmeyer hinterlassenen Sammlungen im Auftrag der Sächsischen Akademie der Wissenschaften zu Leipzig*. Leipzig: Akademie Verlag.
CEToM	Melanie Malzahn et al. 2011–. *CEToM: A Comprehensive Edition of Tocharian Manuscripts*. http://www.univie.ac.at/tocharian
DTB^{2}	Douglas Q. Adams. 2013. *A Dictionary of Tocharian B*. 2nd edn. 2 vols. Amsterdam, Atlanta and Leiden: Rodopi and Brill.
DW III	Jacob Grimm and Wilhelm Grimm. 1862. *Deutsches Wörterbuch*: Dritter Band: E–Forsche. Leipzig: Verlag von S. Hirzel.
DWDS	*Digitales Wörterbuch der deutschen Sprache*. n.d. https://www.dwds.de/d/wb-dwdswb.
eDIL	*Dictionary of the Irish Language*. 2007. Based Mainly on Old and Middle Irish Materials. http://edil.qub.ac.uk/dictionary/search.php.
EWAia II	Manfred Mayrhofer. 1996. *Etymologisches Wörterbuch des Altindoarischen*. Vol. 2. Heidelberg: Winter.
EWAia III	Manfred Mayrhofer. 1996. *Etymologisches Wörterbuch des Altindoarischen*. Vol. 3. Heidelberg: Winter.
GEW II	Hjalmar Frisk. 1970. *Griechisches etymologisches Wörterbuch*. Vol. 2. Heidelberg: Winter.
Hippoc.	Hippocrates. 2012. *Generation. Nature of the Child. Diseases 4. Nature of Women and Barrenness*. Edited and translated by Paul Potter. (Loeb Classical Library 520.) Cambridge, MA: Harvard University Press.
IDS	Mary R. Key and Bernard Comrie (eds). 2023. *The Intercontinental Dictionary Series*. https://ids.clld.org/.
IMM	K.M. Nadkarni. 1942. *Indian Materia Medica*. 3rd ed., revised and enlarged by A.K. Nadkarni. Vol. 2. Bombay: Popular Press.
LIV^{2}	Helmut Rix and Martin J. Kümmel (eds). 2001. *Lexikon der indogermanischen Verben: Die Wurzeln und ihre Primärstammbildungen, unter Leitung von Helmut Rix und der Mitarbeit vieler anderer bearbeitet von Martin Kümmel, Thomas Zehnder, Reiner Lipp, Brigitte Schirmer*. 2nd revised and extended ed. Wiesbaden: Reichert.
LSJ^{9}	Henry G. Liddell et al. 1996. *A Greek–English Lexicon*. 9th ed. Oxford: Clarendon.

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MW	Monier Monier-Williams. 1899. *A Sanskrit–English Dictionary*. Oxford: Clarendon.
NIL	Dagmar S. Wodtko, Britta Irslinger and Carolin Schneider. 2008. *Nomina im indogermanischen Lexikon*. Heidelberg: Winter.
TEB I	Wolfgang Krause and Werner Thomas. 1960. *Tocharisches Elementarbuch*. Vol. 1. Heidelberg: Winter.

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