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DISPARATE COGNATES: POLISH *BRZOZA* VS. ENGLISH *BIRCH*

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Abstract: The purpose of this paper is twofold: firstly, to explain the difference between the pair of cognates: Polish *brzoza* and English *birch*; and secondly, to reveal the reason why these cognates cannot be brought back to identical proto-forms. It is suggested that the English *birch* developed from a collective formation, which underwent the process of singularization. The front vowel in the original collective suffix caused *i*-mutation and palatalization of the voiceless velar plosive. Consequently, Polish *brzoza* and English *birch* cannot be considered exact cognates. The study also has several implications for the method of contrasting cognates.

Keywords: diachronic word-formation, etymology, Proto-Indo-European, Slavic-Germanic cognates, phytonyms, Polish-English cognates, diachronic phonology, sound changes.

1. Introduction

This article continues a series of publications devoted to Proto-Indo-European relics preserved in modern Polish and English (Rychło 2012; 2013; 2018; 2021; Rychło & Witczak 2021). While previous research has focused primarily on structurally transparent cognates, the present study aims to situate itself within the broader context of Indo-European etymological research by addressing more intricate cases of lexical correspondence. The central research question concerns the phonological disparities between seemingly identical forms, a problem which carries significant theoretical implications for the reconstruction of derivational processes in the Late Proto-Indo-European phase.

This paper proposes a reinterpretation of the English lexeme *birch*, suggesting that it developed from a collective formation rather than being a straightforward continuation of a feminine *$*eh_2$*-stem. The methodological approach adopted here – contrasting so-called partial cognates – is of particular significance, as it allows for a precise distinction between direct inheritance and parallel word-formation processes occurring in different linguistic branches. This issue is representative of numerous other Slavic and Germanic lexemes, illustrating the difficulties in accounting for phonological differences that have accumulated over centuries.

The study is organized into several thematic stages. It begins with an overview of the linguistic material and the comparative-historical framework (Section 2). This is followed by a rigorous examination of the phonological trajectories in Slavic and Germanic languages (Section 3), which identifies the specific sound changes that created the modern divergence between Polish and English. The core of the argument is developed in Section 4, which introduces the morphological role of Proto-Indo-European collective formations as the primary driver of this differentiation. The paper concludes (Section 5) by synthesizing these findings and reflecting on their broader implications for the methodology of contrasting cognates.

2. Material and methodology

The following section outlines the linguistic data and the analytical framework employed in this study. To account for the phonological divergence between Polish *brzoza* and English *birch*, a comparative-historical approach is utilized, drawing on evidence from across the Indo-European branches. The analysis is structured to first present the empirical data (Section 2.1) before detailing the specific phonological and morphological methodologies used to reconcile these disparate forms (Section 2.2).

2.1 The material

The primary data for this study consist of the reflexes of the Proto-Indo-European (PIE) root meaning 'bright' or 'shining' as applied to dendronyms. This sub-section provides a comprehensive survey of the attestations of the name for 'birch' in Slavic, Baltic, Germanic, and other Indo-European languages (2.1.1). It further examines the etymological roots and semantic motivations of these terms (2.1.2) and investigates the specific category of collective formations (2.1.3), which provides the crucial link for understanding the development of the English form.

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2.1.1 The attestation of the name of 'birch' in Indo-European languages.

In this sub-section, we examine the specific attestations of the phytonym 'birch' across the major Indo-European groups, focusing on the stem variations observed in Slavic and Germanic. In Slavic, the Polish word *brzoza* has many exact cognates that point to the Proto-Slavic feminine *a*-stem:

EAST SLAVIC: Old Ruthenian: *берéза* (*beréza*), Belarusian: *бярóза* (*bjaróza*), Carpathian Rusyn: *берéза* (*beréza*), Ukrainian: *берéза* (*beréza*), Russian: *берёза* (*berjóza*).

SOUTH SLAVIC: Old Church Slavonic: *брѣза* (*brěza*), Bulgarian: *брезá* (*brezá*), Macedonian: *бреза* (*breza*), Serbo-Croatian: *brèza*, Slovene: *brẹ́za*.

WEST SLAVIC: Old Czech: *břieza*, Czech: *bříza*, Polish: *brzoza*, Slovak: *breza*, Polabian: *brezŭ*, Kashubian: *brzoza*, Slovincian: *brzôza*, Lower Sorbian: *brjaza*, Upper Sorbian: *brěza*

(Derksen 2008: 88; Sławski 1974: 210; Trubachev 1974: 201; Vasmer 1987: 77).

Apart from the feminine *ā*-stem, several Slavic languages exhibit the *o*-stem variants pointing to Proto-Slavic **bèrzъ* (masculine) from Proto-Indo-European **bʰerHǵós*:

EAST SLAVIC: Ukrainian: *бéрез* (*bérez*) (dialectal).

SOUTH SLAVIC: Serbo-Croatian: Cyrillic script: *брȅз* (*brëz*) – dialectal, Slovene: *brèz* (Trubachev 1974: 207).

In BALTIC, we find the *o*-stems: Lithuanian *béržas* 'birch', Latvian *bę̃rzs* 'birch'; Old Prussian *berse* 'birch' (Derksen 2015: 88; Smoczyński 2018: 112). According to Sławski (1974: 210), in Proto-Indo-European, the word belonged to feminine *o*-stems and in Slavic it transferred to *a*-stems, e.g. *snъcha* (PIE **snusos*).

In Proto-GERMANIC, the basic word for 'birch' is reconstructed as **berkō* f. 'birch', based on the following cognates: ON. *bjǫrk* f. 'birch', Norw. *bjørk* 'id.', Sw. *björk* 'id.'; OE. *beorc* f., Du. *berk* c.; OHG. *biricha*, G. *Birke* f. 'id.' (Kroonen 2013: 61; Levitskiy 2010: 98; Orel 2003: 43; Zalizniak 1965: 216-217). In addition, Old English exhibits several variants *bierce*, *byrce*, and *birce* f. 'birch' (OED), which point to PG. **berkijō* f., rather than **berkō* 'birch'. In Gothic, there is also *bercna* '*b*-rune of the Gothic Runic alphabet', the word is sometimes compared with the name of 'birch' and derived from **berknō* (Lehmann1986: 66; Orel 2003: 43).

Outside Slavic and Germanic, cognates are attested in INDO-IRANIAN:

Sanskrit: *bhūrjá-* m. 'kind of birch' (Mayrhofer 1996: 269-270),

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Digor Ossetian: *бæрзæ* (*bærzæ*) (Edelman 2003: 127-128) / Iron Ossetian: *бæрз* (*bærz*) (Edelman 2003: 127-128).
ITALIC: Latin: *fraxinus*, which displays a different meaning: 'ash-tree'. (the quantity of the *a* is unknown, cf. de Vaan 2008: 240-241). As for the origin, Latin: *fraxinus* may have descended from PIE *$*b^hrHǵ$-s-e/i-no-*, a derived adjective with zero-grade of the root (cf. Mallory and Adams 1997: 65; de Vaan 2008: 240-241).
ALBANIAN: Albanian: *bardhë* 'white' (Orel 1998: 17).

On the basis of the evidence provided above, etymological dictionaries propose the following Indo-European reconstructions: "**bherəĝ-*, **bhrēĝ-* 'glänzen, weiß', wozu auch der Birkenname N. Sg. ****bhérəĝ-s***, G. Sg. ****bh$_e$rəĝós***" (Pokorny 2002[1959]: 139). Mann (1984/87: 73), who concentrates on the Late Indo-European phase, reconstructs ****bhérĝos, ā*** 'birch', 'the bright tree'. Earlier studies focusing on dendronyms in Proto-Indo-European include Friedrich (1970). Different aspects of phytonymic lexicon in several languages have also been investigated by Panasenko (2010; 2021; 2023a; 2023b). These studies often explore the cognitive-onomasiological structures of plant names, highlighting how sensory perceptions – such as color or texture – serve as primary motivational features in naming processes. In the case of *birch*, Panasenko's focus on the 'colorative' aspect of phytonyms provides a theoretical framework for the semantic link between the tree's white bark and the PIE root **bherh$_1$ǵ-* 'to shine', further illustrating how cognitive salience dictates lexical stability across Indo-European branches.

2.1.2 The etymology of the name of 'birch'

To understand the etymology of the words for 'birch' which are descended from Proto-Indo-European **b^{h}erHǵós*, it is important to consider the semantic motivation of the etymological meaning. The verbal root from which **b^{h}erHǵós* must have been derived is PIE **b^{h}reh$_1$ǵ-* 'shine, glow', cf. Ved. *bhrā́jate* 'shines, glistens', Av. *brāzaiti* 'gleams' < * b^{h}reh$_1$ǵ-e- (Mann 1984/87: 101; Pokorny 2002[1959]: 139; Rix 2001: 92).

It is also instructive to inspect other derivatives of the same root **b^{h}erHǵ-*:

1) Polish *brzask* < Old Polish *brzazg* < Proto-Slavic **brěgъ* m. 'dawn'. For Balto-Slavic, Derksen (2008: 61 and 2015: 99) reconstructs a verbal stem **b^{h}reh$_1$ǵ-sk-* (Skt. *bhrājate* 'shine, beam'),
2) English *bright* < OE *beorht* adj. 'bright' (West Saxon), Merc., North. *berht* (Goth. *bairhts* adj. 'bright, clear, manifest, evident', ON *bjartr* adj. 'bright, shining; illustrious', OS *berht* adj. 'shining', OHG *beraht* adj. 'bright, shining', MHG *berht* adj. 'id.') from PG. **berhtaz* adj.

'bright' < PIE *$b^herh_1ǵ$-to-* (cf. Kroonen 2013: 60). These Germanic words are also cognates with another dendronym represented by Polish *brzost* (see the next point),

3) Polish *brzost* 'a species of elm' < Proto-Slavic **berstъ* m. 'elm' < PIE *$b^herHǵ$-tó-*, cf. Derksen (2008: 37-38) for further cognates in Slavic. Cf. also Polish collective formation *brzeście* (Bańkowski 1972: 282),
4) Lithuanian *brė́kšti* 'dawn, get light', 'grow dark' – see Smoczyński (2018: 144),
5) Welsh *berth* adj. 'beautiful',
6) Alb. *bardhë* 'white' (Orel 1998: 17).

The etymological relationship between 'birch' and words meaning 'bright', 'shine', 'dawn' can be interpreted in terms of semantic motivation, i.e. the bright colour of the birch's bark is reflected in the dendronym. Moreover, it is interesting to note one of the obsolete names of March, namely Polish *brzezień*, Cz. *březen* and Ukr. березень / *berezeń* 'March', whose name must be motivated by 'birch'. The reason for that may lie in the practice of collecting birch sap (Polish *oskoła*) at the break of winter and spring.

As far as the derivatives based on the word for 'birch' are concerned, an interesting connection can be observed between:

- PG **berkīnaz* adj. (ON *birkinn* 'related to birch', OE *bircen*, *beorcen* id., OHG *birkīn* id.) Derived from **berkō* – cf. Orel (2003: 42), and
- PSl. **berzina* 'birch forest, birch thickets; birch twigs; birch wood', 'single birch tree' (Pol. *brzezina* 'birch forest, birch thickets, birch trees in the forest; cut birch twigs; birch wood', USorb. *brězyna* 'birch forest', Cz. *březina* 'birch forest, grove, birch thickets' (since 14th c.), Ru. *берёзина* 'a felled or chopped birch', dial. 'a single birch; a large birch, a chopped birch, a birch trunk; birch wood; a rod, a birch stick; birch twigs', Ukr. *берéзина* 'birch forest; felled or fallen birch, birch tree', dial. also 'birch twigs, birch forest, grove, birch thickets' – cf. Sławski (1974: 210-211).

Beyond these primary forms, the root has yielded numerous derivatives across various branches. Of particular importance for the present study are the collective formations, as they provide the necessary morphological context to explain the phonological divergence between the Slavic and Germanic reflexes. These formations are adduced and analyzed in the following sub-section.

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2.1.3 The attestation of the collective name 'group of birch-trees; birch forest, birch grove'

A number of derivatives, especially in North Germanic languages, point to PG. **berkijan* n. coll. 'birch forest, birch grove': ON. *birki* n. 'birch forest', Icel. *birki* 'birch forest; birch', Norw. *birki* 'birch forest', Sw. *björke* 'birch forest, birch grove' (Falk, Torp 1910: 74-75, s.v. *Birk*; Jóhannesson 1956: 623; de Vries 1977: 37). These tree collective names may have been descended from PG. **berkijan*, which is either derived from the Proto-Germanic arboreal term **berkō* f. 'birch' (Habrajska et al. 2020), or it can be traced back to PIE. **b^{h}erh$_{1}$ĝi̯om* n. coll. 'group of birch-trees; birch forest, birch grove' (Rychło & Witczak 2022).

Apart from the Scandinavian languages, several West Germanic forms should be adduced here: OE. *bierce*, *byrce*, *birce* f. 'birch'; OS *birka*; OHG *birca* (Orel 2003: 42). Although the meaning is not clearly collective, as in the North Germanic languages, the palato-alveolar affricate /tʃ/, which is still pronounced in English *birch*, must have arisen due to early Old English palatalization, which was triggered by a preceding front vowel or the approximant **j*. Since there were no such sounds (following **k*) in **berkō* f., it seems possible that OE. *bierce*, *byrce*, *birce* represent singularized reflexes of PG. **berkijō* f. coll. 'birch forest, birch grove', which, in turn, points to PIE **b^{h}erh$_{1}$ĝi̯eh$_{2}$* (f. coll.). To substantiate this proto-form, it is worth adducing the Lithuanian place-name *Beržijà.* Further analysis is offered in Section 4.

SLAVIC: PSl. **berzьje* n. coll. 'birch grove, birch forest' (Sławski 1974: 213; Trubachev 1974: 208) demonstrates an extensive attestation and a large distribution in the Slavic languages, cf. Ru. *берéзье* n. 'birch forest, birch twigs'; OPol. *brzezie* n. 'birch forest', Pol. *brzezie* n. 'birch grove or forest'; Cz. *březí* n. 'small birch-grove', also *břízí* n. 'birch twigs, birch-wood'; Slk. *brezie* n. 'small birch-forest, birch-grove'; SC. *brêzje* n. 'birch forest', Sln. *brẹ̑zje* n. 'id.'.

Neither Trubachev (1974: 8) nor Sławski (1974: 213) provides further cognates outside Slavic, specifying that PSl. **berzьje* n. coll. 'birch grove, birch forest' was derived from PSl. **berza* 'birch'. In view of the Germanic equivalents, which exhibit exact sound correspondences with the Slavic comparanda, another etymological possibility becomes increasingly probable: instead of being independently derived (**berzьje* in Slavic and **berkijan* in Germanic), both of these collective nouns may have been inherited from a shared common ancestor. Recent research has shown that these collective formations can be substantiated with many examples.

2.2 The methodology

When comparing possible cognates (and candidates for cognates), an important basic question, which is sometimes difficult to answer, is whether the comparanda are descended from an identical proto-form in a shared ancestor language. Slavic dendronyms descended from PSl. **berza* 'birch' superficially look as if they were descended from the same etymon as the English *birch* or German *Birke*, but a closer examination reveals difficulties in tracing their developments by means of the known sound changes. Similarly, the Proto-Slavic noun **sad-ja* f. 'soot' (Polish *sadza*) does not represent the same formation as PG. **sōt-a-n* n. 'soot' (English *soot*), cf. Witczak, Rychło (2022).

The approach to contrastive analysis adopted in the present paper aims at explaining the phonological and morphological processes which have led to the discrepancies between the forms of the cognates under analysis. If the known sound changes cannot bring some cognates to an identical proto-form, the derivational processes which altered the shape of the etymon should be taken into consideration. In the conclusions, all the changes are sequenced in chronological order.

3. Phonological development of the cognates

This section investigates the sound changes responsible for the difference between Polish *brzoza* and English *birch*. Subsection 3.1 concentrates on the development from PIE **b*^{h}*erh*$_1$*ĝ-eh*$_2$ to Polish *brzoza* and Subsection 3.2 investigates changes that must have led to English *birch*.

3.1 The development of Polish brzoza

The first changes which transformed the PIE word **b*^{h}*erh*$_1$*ĝ-eh*$_2$ affected the laryngeals, which were either lost, as was the case with the first laryngeal, which was surrounded by the consonants, or coloured and lengthened the vowel *e*, which it followed, as was the case with the final *h*$_2$. Before the Proto-Slavic phase, two other developments modified the consonants: the aspirated *b*^{h} lost its aspiration and the palatal plosive *ĝ* underwent the *satem* assibilation leading to PSl. **z*. After these changes, the word evolved into PSl. **berza.* Following the split of the Slavic languages, in the so-called TORT sequence of sounds, metathesis took place in the language ancestral to Polish. The front vowel *e* in the resulting word **breza* gradually palatalized the preceding /r/ leading to **br*^{j}*eza.* The next development must have been the Polish sound shift (sometimes called *przegłos lechicki* 'Lechitic sound shift'), which changed **e* to *o* before one of seven consonants (*t*, *d*, *s*, *z*, *n*, *r* and *l*, which later developed to *ł* in Polish). The resulting word **br*^{j}*oza*, probably simultaneously, saw the gradual development of the liquid trill, which can be described in the following way: *r*^{j} > *r*^{ž} > *rz*. The sequence of these changes has led to Polish *brzoza.*

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3.2 The development of English birch

From PIE *$b^herh_1\hat{g}$- to PG. **berk* the following changes must have occurred: elimination of laryngeals (Ringe 2006: 15) and Grimm's Law (Ringe 2006: 93-115; Rychło 2014), the earliest evidence of which arguably dates back to the time of Pytheas (Witczak, Rychło 2023). Before the sequence of /r/ plus another consonant, the vowel underwent breaking (Ringe & Taylor 2014: 180-183), which resulted in the form recorded in Old English *beorc.* If we compare the development of words like OE *deorc* > Mod.E. *dark* and OE *beorcan* > Mod.E. *bark*, the OE *beorc* in Modern English would be expected to yield /bɑːk/ and be homophonous with the verb *bark* and with the noun *bark* meaning 'the tough protective outer sheath of the trunk', but is clearly different from Modern English *birch.*

The English pronunciation with the palato-alveolar affricate /tʃ/ results from early Old English palatalization and assibilation, which, among other sounds, affected /k/, which eventually became /tʃ/. Hogg (1992: 252-269) discusses the processes in detail, distinguishing palatalization from assibilation. For the purposes of the present study, it is important to note that the trigger of the palatalization is a front vowel or the approximant /j/, which we do not find in such reconstructions as **berkō* f. 'birch' (Kroonen 2013: 61). Consequently, Modern English *birch* cannot go back to **berkō*, but can be considered a reflex of **berkjō(n)*, which is further discussed in Section 4.2.

The later development of the word involved the coalescence of three Late Middle English vowels */i, u, e/* into one phoneme at the close of the 16th century (cf. Wełna 1978: 216). As a result of this change, he following words are now pronounced with the same vowel /ɜː/:

(a) *birch, bird, dirt, first, girdle, girl, sir, stir, third, virgin* (from LME /ir/),
(b) *burden, burst, church, churl, cur, curse, disturb, fur, nurse, turn, urchin, word, work, worm, worse, worst, wort* (from LME /ur/),
(c) *certain, deserve, err, kernel, person, serve, sterling, swerve* (from LME /er/).

Loss of preconsonantal *r* in non-rhotic dialects leading to BrE /bɜːtʃ/ concludes the sequence of changes which are summarized in tabular form in the conclusions.

4. The morphology of PIE *$b^herh_1\hat{g}$-i̯eh$_2$

The morphological factors relevant for the present study include the gender (discussed in Section 4.1) and the category of collective nouns (discussed in Section 4.2).

4.1 The gender

The problem requiring further explanation concerns the question of gender, namely the contrast between the unusual feminine *o*-stems indicated by some Indo-European branches contrasted with *eh₂*-stems (later *ā*-stems, as in PSl. **berza* 'birch'). Dendronyms typically exhibited feminine gender in Proto-Indo-European, which may be understood metaphorically in terms of trees giving birth to fruit. This association is reflected in many Indo-European languages, which use the same verb for 'giving birth' and for 'producing fruit', e.g. the English verb *bear*, as in *the tree bears fruit* or Polish *rodzić*, as in *drzewo rodzi owoce*.

Interestingly, the *o*-stems, which are typically masculine, display the feminine gender in many names of trees, which may be illustrated with Latin:

corulus 'hazel-tree, hazel-wood' [f.],
aesculus 'kind of oak-tree' [f.],
alnus 'alder' [f.],
citrus 'citron-tree (*citrus medica cedra);* African tree *(thuia articulatdy*)' [f.],
cornus 'cornel cherry-tree' [f.],
fāgus 'beech' [f.],
ornus 'kind of ash-tree' [f.],
quercus 'oak-tree' [f.],
taxus 'yew-tree' [f.].

Similarly, Lat. *fraxinus*, although representing the *o*-stem, exhibited the feminine gender, which suggests that this may have been the case in Proto-Indo-European. This conclusion is open to question, especially if we assume that the feminine gender developed later than Proto-Indo-European.

4.2 Derived collective names

At the level of Proto-Indo-European reconstructions, there seem to be two collective formations derived from the word for 'birch': ****bʰerh₁ĝi̯om*** n. coll. and ****bʰerh₁ĝ-i̯eh₂*** f. coll. The supporting lexical material for both reconstructions is presented in Section *2.1.3.* In this section, an attempt is made to support the reconstruction of PIE *$b^herh_1ĝ$-i̯eh₂ f., from which, arguably, Modern English *birch* is descended. This feminine collective formation can be illustrated with the following parallel examples:

PG. ****tainijōn-*** 'basket, a collection of twigs put together' (derivative of PG.**taina*-).

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Goth. **tainjo* '(large) basket', OI *teinur* f. pl. 'basket, creel', *teina-stæði* n. 'place where creels are put', OHG *zeinna*, MHG *zeine*, NHG dial *Zaine*, *Zein(e)* 'basket, net'; OE dim *tǣnel* 'wicker-basket' (Lehmann 1986: 340). Etymologically, PG. **tainijōn-* may be interpreted as the collective formation based on PG. **taina-* 'twig, sprig' (Goth. *tains* m. 'branch, shoot, twig', ON *teinn* m. 'twig; spit; stake', OE *tān* m. 'twig, sprout, shoot' (cf. NE *mistle-toe*, Onions 1966: 582), MLG *ten* m. 'thin metal rod; shaft of an arrow', MDu. *teen* m. 'willow twig', Du. *teen* c. 'id.', OHG *zein* m. 'twig, stick, ruler, shaft, pipe, bar (of metal)', MHG *zein* m. 'stick, twig, staff' (Kroonen 2013: 506; Lehmann 1986: 340).

PIE. ****tŕ̥niį̯eh₂*** f. coll. 'thorn-bush'.

Skt. *tr̥ṇyā* f. 'a heap of grass' (Monier-Williams 1999: 453), originally a collective noun derived from Ved. *tŕ̥ṇam* n. (*o*-stem) 'grass, herb, stalk';

PG. **þurnijō* f. coll. 'thorn-bush, thorny plants', attested exclusively in OE. *þyrne* f. 'briar, thorn-bush, thorny plants' (Kroonen 2013: 553; Lehmann 1986: 357; Orel 2003: 430). The derivational basis is confirmed not only by Goth. *þaurnus* m. (*u*-stem) 'thorn-plant' (< PG. dial. **þurnuz* m.), but also by ON. *þorn* m., OE. *þorn* m., E. *thorn*; OFri. *thorn* m., ODu. *thorn* m.; Du. *doorn* c. 'thorn, briar'; OHG. *thorn*, G. *Dorn* m. 'thorn' (< PG. **þurnaz* m. *o*-stem) (Levitskiy 2010: 573).

PSl. **tьrnьja* f. coll. 'thorn-bush', exclusively attested in Kash. *cėřńå* f. 'thorn', f. coll. 'thorn-bush, thorns'.

Etymology: A Late Indo-European archetype is supported by three independent reflexes preserved in Sanskrit, Old English and Kashubian, respectively.

Commentary: A morphological variation between Proto-Slavic **tьrnьja* f. coll. and **tьrnьje* n. coll. 'thorn-bush' seems to document an original phenomenon (PIE. **tŕ̥niį̯eh₂* f. coll. 'thorn-bush' vs. **tr̥niį̯óm* n. coll. 'id.').

References: Kroonen (2013: 553); Rychło and Witczak (2022: 166-167)

PIE. ****bʰréh₂triį̯eh₂*** f. coll. 'group of brothers; brotherhood, fraternity'.

Gk. Att. φρᾱτρίᾱ f. coll. 'family group; clan, phratry; a subdivision of the phyle in Athens',

Lith. dial. (in Kurschat's dictionary) *brotìja*, *brotijà* f. 'circle of the most faithful friends' (< PB. **brātríjā* f. coll. 'brotherhood, brothers'.

PSl. **bratrьja* f. coll. 'brothers; brotherhood', cf. OCS. *братрия,* OSln. *bratria*, OČak. (15th c.) *bratrja*, ORu. *братрия* f. coll., OPol. *bratrza* f. coll., LSorb. (obsolete) *bratśa*, USorb. *bratřa* pl.

'brothers', Cz. *bratří* pl. 'brothers', Slk. *bratia*, also *braträ* pl. 'brothers' (Králik 2015: 80; Mańczak 2017: 10).

Toch. A *pratri* 'brothers' (Witczak 2016: 126-130). Theoretically, it is not impossible that Toch. A *pratri* represent a collective noun of the feminine gender.

Etymology: The collective in question should be analysed in an obvious relation to the adjective (IE.) *$b^hr\acute{a}tri\underline{i}os$* (< PIE. *$b^hréh_2tri\underline{i}os$*) 'pertaining to the brother', as well as the basic noun (IE.) *$b^hr\acute{a}tēr$* (< PIE. *$b^hréh_2ters$*) m. 'brother'.

Commentary: The feminine collective noun *$b^hréh_2tri\underline{i}eh_2$* can hardly be separated from the neuter one *$b^hreh_2tri\underline{i}óm$* (n. coll. 'group of brothers; brotherhood, fraternity'). It seems highly probable that both collective formations independently existed in Proto-Indo-European and were inherited in some daughter subgroups.

References: Lehmann (1986: 81); Rychło, Witczak (2022: 159); Witczak (2016: 126-130); Witczak et al. (2022: 162, 169).

PIE. ***$g^{\mu}ó\underline{u}i\underline{i}eh_2$*** f. coll. 'herd of cows'.

INDO-ARYAN: Ved. (only in Pāṇini) *gávyā* f. coll. 'cow-herd'.

BALTIC: Lith. *gaujà* f. coll. 'flock, pack, herd, bunch, band, gang'; Latv. *gauja* f. 'crowd' (originally 'herd of cows').

GREEK: Gk. Lac. βοῦα f. coll. 'a band of young Spartan boys' (as if from PGk. *βόϝυ̯ᾱ) (Kaczyńska 2019).

Etymology: It represents a feminine variant of the adjective *$g^{\mu}ó\underline{u}i\underline{i}os$* 'pertaining to cows, belonging to cows', whic derives from IE. *$g^{\mu}ó\underline{u}$*- f./m. 'cow, ox'.

Commentary: The Linear B term *qo-wi-ja* (transcribed as *$G^{\mu}ó\underline{u}i\underline{i}ā$*) seems to refer to a Mycenaean goddess, presumably a divine patron of cow-herds.

References: Kaczyńska (2019: 93-103); Rychło et al. (2024: 90-91); Rychło and Witczak (2022: 161-162); Witczak et al. (2023); Witczak et al. (2022: 163).

The examples and the studies cited above provide compelling evidence for the thesis regarding the systemic nature of collective formations in *-*i̯om* and *-*i̯eh₂* in Proto-Indo-European. Their analysis demonstrates that these derivatives were not merely marginal innovations of individual dialects but constituted a productive morphological mechanism used to designate groups of people, animals, and – crucially for the present study – plants. The evidence presented here suggests that the collective formation from which the English *birch* can be derived was already established in Proto-Indo-

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European and may have persisted into the Germanic branch as a functional morphological type, albeit eventually singularized.

4.3. Onomastic structures as a reflection of collective formations

An additional, empirical support for the productivity of collective formations based on tree names can be found in their extensive presence in onymy, particularly in toponymy (cf., e.g., Polish place names such as *Brzezie*, *Brzezień*, *Brzeziny*, *Brzeźnia*, *Brzeźnica*, *Brzeźno*, *Brzozów*, and *Brzóze*). Dendronyms played a key role in the naming processes of many Indo-European traditions. In the Polish and Slavic context, Bańkowski's research (1972) on collective nouns derived from tree names in Polish toponymy, as well as Gliwa's (2016) analysis of the lexeme *brzoza* as a toponymic base, clearly indicate the frequent use of collective forms to designate topographical features. A similar phenomenon is observed in Silesia (Lech-Kirstein 2015) and in the South Slavic tradition (Čargonja et al. 2008), where these formations serve as stable naming bases. The presence of historical variants of both *brzoza* and *birch* in place names not only confirms their cultural significance but also provides evidence for the vitality of collective derivatives which, as argued in Section 4.2, underlie the phonological evolution of the analysed English form. This interdisciplinary link between historical lexicology and onomastics further strengthens the argument regarding the morphological genesis of the English cognate. Such a robust grounding of the proposed reconstruction in both comparative material and onomastic data allows us to proceed to a synthesis of the conclusions regarding the specific phonetic and morphological evolution of the *brzoza–birch* pair.

5. Conclusions

The present analysis of the phonological and morphological development of Polish *brzoza* and English *birch* leads to several broader conclusions regarding Indo-European comparative research. While the study has focused primarily on these Polish-English cognates, the issue of disparate phonological shapes identified here is transferable to other Slavic and Germanic languages. As such, it serves as a salient illustration of the difficulties inherent in explaining the differences among cognates that have accumulated over centuries. The results of the research can be summarized as follows:

1. Polish *brzoza* and English *birch* share a common root, but they are not exact cognates sensu stricto.
2. The pair representing exact cognates sensu stricto is Polish *brzoza* and Old English *beorc*; however, modern English *birch* is not a direct continuation of Old English *beorc.*

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3. Etymological dictionaries and other publications (e.g. Kroonen 2013, Mallory and Adams 1997: 65) that derive English *birch* from OE *beorc* < PG. **berkō* should revise this lineage: English *birch* < OE *birce* < PG. **berkjō-*, because the reconstruction of the Proto-Germanic etymon of OE *birce* should include the sounds that trigger palatalization and *i*-mutation.
4. The development from PIE **b^{h}erh$_1$ĝ-eh$_2$* to Polish *brzoza* and from PIE **b^{h}erh$_1$ĝ-i̯eh$_2$* to English *birch* can be outlined as in the table below:

Table 1 The development from PIE **b^{h}erh$_1$ĝ-eh$_2$* to Polish *brzoza* and from PIE **b^{h}erh$_1$ĝ-i̯eh$_2$* to English *birch.* Source: Own processing

Sound Change	**From PIE *b^{h}erh$_1$ĝ-eh$_2$ > Polish *brzoza***	**From PIE *b^{h}erh$_1$ĝ-i̯eh$_2$ > English *birch***
1. PIE *h_2 > ø , *eh_2 > *$ā$	**b^{h}erĝ-ā*	**b^{h}erĝ-i̯ā*
2. PIE **bh* > PG. **b* 3. PIE **ĝ* > PG. **k* 4. PIE **ā* > PG. **ō*		**berk-iō-*
5. PIE **bh* > PSl **b* 6. PIE **ĝ* > PSl **z*	**berz-ā*	
7. Apocope 8. Early Old English Palatalisation 9. Breaking 10. *i*-umlaut 11. *i*-lowering 12. Monophthongisation 13. Apocope		**berk-i* **berc-i* **beorc-i* **bierc-i* OE *bierce* *birche* *birch*
14. The metathesis of tort	**breza*	
15. Palatalisation: *r* > *r^j*	**br^{j}eza*	
16. The Lekhitic soundshift *e* > *o*	**br^{j}oza*	
17. OP r^j > r^ž > P rz /ʒ/	*brzoza* /bʒɔza/	
18. LME */i, u, e/* (+ /r (C)/) > ENE */əə/* (= */ə:/)* 19. ENE *ə:* > Mod.E. ɜ: 20. Loss of preconsonantal *r* in non-rhotic dialects, vowel lengthening		BrE *birch* /bɜ:tʃ/

5. The method of contrasting cognates in modern languages serves as an effective tool for verifying established etymologies and refining our understanding of ancient lexical relationships.
6. The present study offers several implications for improving the method of contrasting cognates:
   a) In the case of partial cognates sharing a common root, an attempt should be made to search for formerly productive derivational categories that may explain the disparate phonetic or morphological shapes of the comparanda. Regarding PG. **berkjō-*, this likely involved a

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collective formation, represented by such examples as Polish *bracia*, *księża* or Greek φρατρία.

b) In the case of independent derivatives (or what is labelled as derivatives in individual languages, e.g. Proto-Slavic *berzьje*), it is necessary to search for possible cognate formations in other branches. Such forms may, in fact, be inherited rather than autonomous innovations.

c) Consequently, certain Germanic and Slavic collective nouns should not be treated as independent derivatives – as is often assumed in etymological dictionaries – but should be reassessed as potentially inherited cognates of a common ancestor.

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Abbreviations

Languages and dialects

Alb. – Albanian; Cz. – Czech; Du. – Dutch; E. – English; G. – German; Gk. – Greek; Goth. – Gothic; Icel. – Icelandic; IE. – Indo-European; Kash. – Kashubian; Lat. – Latin; Latv. – Latvian; Lith. – Lithuanian; LSorb. – Low Sorbian; MDu. – Middle Dutch; MHG. – Middle High German; Mod.E. – Moder English; Norw. – Norwegian; OČak. – Old Čakavian; OCS. – Old Church Slavic; OCz. – Old Czech; OE. – Old English; OHG. – Old High German; ON. – Old Norse; OPol. – Old Polish; OPrus. – Old Prussian; ORu. – Old Russian; OSax. – Old Saxonian; OSln. – Old Slovenian; OSw. – Old Swedish; PG. – Proto-Germanic; PIE – Proto-Indo-European; Pol. – Polish; Polab. – Polabian; PSl. – Proto-Slavic; Ru. – Russian; SC. – Serbo-Croatian; Skt. – Sanskrit; Sln. – Slovenian; Sw. – Swedish; Ukr. – Ukrainian; USorb. – Upper Sorbian; Ved. – Vedic.

Glosses

adj. – adjective; c. – genus commune (common gender); coll. – collective; dial. – dialectal; f. – feminine; gen. – genitive; id. – idem / the same meaning; m. – masculine; n. – neuter; pl. – plural; sg. – singular; s.v. – sub voce.

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