Northwest Caucasian Languages and Hattic

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Abstract

The relationships among five Northwest Caucasian languages and Hattic were investigated. A list of 193 core vocabulary words was constructed and examined to find look-alike words. Data for Abhkaz, Abaza, Kabardian (East Circassian), Adyghe (West Circassian) and Ubykh drew on the work of Starostin, Chirikba and Kuipers. A sub-set list of 15 look-alike words for Hattic was constructed from Soysal (2003). These lists were formulated as character data for reconstructing the phylogenetic relationships of the languages. The phylogenetic relationships of these languages were investigated by a well-known method, Neighbor Joining, as implemented in PAUP* 4.0. Supporting and dissenting evidence from human genetic population studies and archeological evidence were discussed.

This project has produced a provisional set of character data for the Northwest Caucasian languages and, to a limited extent, Hattic. Phylogenetic trees have been generated and displayed to show their general character and the types of differences obtained by alternate methods.

This research is a basis for further inquiries into the development of the Caucasian languages. Moreover, it presents an example of the method for contrast queries application in studying the evolution of language families.

Keywords: Northwest Caucasian Languages, Hattic, Historical Linguistics, Circassian, Adyghe, Kabardian

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Kuzeybatı Kafkas Dilleri ve Hattice

Özet

Bu araştırma beş Kuzeybatı Kafkas Dilleri ve Hatik arasındaki ilişkiyi incelemektedir. Bu beş dilde 193 ana kelime oluşturulmuş ve benzerlikleri araştırılmıştır. Abhaz, Abaza, Adige, Kabartay ve Ubıh verilerinde Starostin, Chirikba ve Kuiper'ın çalışmaları esas alınmıştır. 15 kelimelik bir alt Hatik listesi Soysal'ın çalışmasına dayanmaktadır. Bu listeler filogenetik ilişkileri oluşturabilmek için karakter listeleri olarak formüle edilmiştir. Bu dillerin filogenetik ilişkileri oldukça yaygın olarak kullanılan 'Neighbor Joining' yöntemiyle PAUP* 4'de araştırılmıştır. Ayrıca bu dillerin ilişkilerini destekleyen ve desteklemeyen gurup genetik çalışmaları ve arkeolojik veriler de tartışılmıştır. Bu proje Hatik için sınırlı olmakla beraber, Kuzey Batı Kafkas Dilleri için bir ön karakter veri seti oluşturmuştur. Filogenetik ağaçlar, bu diller arasındaki genel ilişkiyi sergilemektedir. Bu araştırma Kafkas Dillerinde bu tür araştırmalara bir temel teşkil etmektedir. Ayrıca, dil ailelerinin evrimi çalışmalarında kontrast sorgulama uygulamalarına yönelik bir yöntem örneği sunmaktadır.

Anahtar Kelimeler: *Çerkesçe, Adıge, Kabardey, Hatti, Kuzeybatı Kafkas Dilleri, Dilbilim*

1. Introduction

The small Northwest Caucasian (West Caucasian or Abkhazo-Adyghean) linguistic family takes its name from the geographical region, North West (Trans) Caucasia, where the speakers of the relevant languages lived closely until Russian political and military expansion into the Caucasus culminated in their victory in 1864. The Northwest Caucasian linguistic group consists of five languages: Abhkaz, Abaza, Kabardian (East Circassian), Adyghe (West Circassian), and Ubykh. Until the middle of the nineteenth century the speakers of these languages inhabited only the Northwest Caucasus (**Hata! Başvuru kaynağı bulunamadı.**). In the decade following the Russian conquest of the Caucasus in 1864, all Ubykhs together with most of the Circassians and Abkhazians

resettled through-out the Ottoman Empire, and are today found scattered around Middle East, Europe, North America and, most prominently, in Turkey. The last Ubykh speaker, Teyfik Esenç, died in Turkey in 1992. Today the four surviving Northwest Caucasian languages have minority language status in the Russian Federation and are used in home and village life in isolated pockets of the diaspora.

Figure 1. Ethnolinguistic groups in the Caucasus

Although a genetic relationship between the Northwest Caucasian languages is widely accepted, any genetic relationship between the NWC and Hattic (an ancient Anatolian language) is contested. Resolution of this question is difficult, principally due to the scarcity of reliable material in Hattic. The present study does not propose to resolve the relationship of Hattic to Northwest

Caucasian languages, but to summarize the current state of discussion and encourage further work on the issue.

The structure of the rest of this paper is as follows. Sections 1a and 1b present background information on the Northwest Caucasian Languages and Hattic respectively while 1c shows relevant population genetics data. Section 2 presents the method. Section 3 introduces phylogenetic analysis and the results. Section 4 presents the results. Finally, section 5 discusses the results and conclusion.

1a. The Northwest Caucasian Language Family

The five languages of the Northwest Caucasian family have been widely recognized as being closely related both typologically and genetically.

Linguists have identified a Northwest Caucasian linguistic type (Smeets, 1984). Many typological features which are shared within the family are distinct and unusual among the world's languages.

- NWC languages have large consonant inventories ranging from 45 consonants in Kabardian to 83 consonants in Ubykh, while possessing only a small number of vowels.

- Most NWC languages have a vertical vowel system, containing only three vowels which are distinguished by their height (the degree of aperture).

- NWC languages are ergative, polysynthetic, verb final and highly agglutinative

- Verbs in NWC languages express a vast number of grammatical relations (subject, object, location, mood etc.) via affixes, which occur in fixed order with respect to the verbal root. The majority of these affix positions occur before the root. Kabardian has 13 prefix positions and 5 suffix positions (Bozkurt-Applebaum 2013)

- Verbal and nominal roots have predominantly one or two syllables.

- NWC languages favor syllable structures C(V) or CVC(V), where C denotes a consonant or consonant cluster and parenthesis indicates the final vowel is optional.

The genetic relationships of the five NWC languages been the subject of numerous researchers who have in broad terms reconstructed the relationships in similarly. The posited generic relationships between the NWC languages shown in Figure 2 are reaffirmed under different names by Kuipers (1975), Colarusso (1992), Nikolayev and Starostin (1994) and Chirikba (1996).
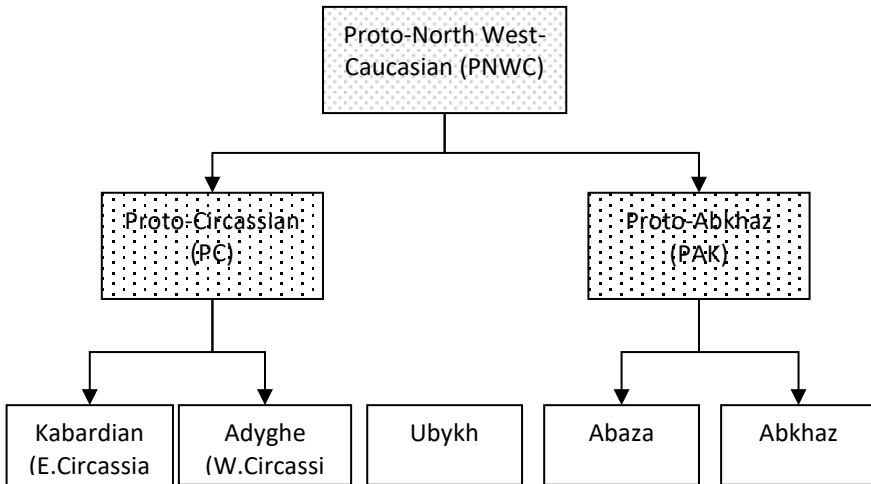

Figure 2. Posited relationships of the Northwest Caucasian Languages

Proto-Circassian (PC) is reconstructed from Kabardian and Adyghe dialects which are mutually intelligible. Similarly, Proto-Abkhaz (PAK) is reconstructed from Abaza and Abkhaz dialects and they are mutually intelligible. Ubykh occupies an intermediate position between Proto-Circassian and Proto-Abkhaz. As there is no known dialect of Ubykh it is not possible to construct a protolanguage for Ubykh which would have existed contemporaneously with Proto-Circassian and Proto-Abkhaz.

In light of the extensive typological correspondences between the Northwest Caucasian languages, a common protolanguage (PNWC) is posited from the relationships of PC, PAK and Ubykh.

The process and chronology of the division of PNWC to its daughter languages is controversial. Chirikba (1996: 7-9) gives an account of the historical development of these languages which suggests that Proto-Circassian was the first to split from PNWC, and

that only later did Ubykh and Proto-Abkhaz separate. This contrasts with the account of Kumaxov (1976: 48-57) who posits that Proto-Abkhaz separated from Proto Circassian-Ubykh before the division between Ubykh and Proto-Circassian.

1b. Hattic

Hattic is a non-Indo-European language which was spoken in central Anatolia in the 3rd millennium BC, before the appearance of the Hittites (see Figure 3). By the early 2nd millennium the Hittites, who spoke an Indo-European language, absorbed and replaced the Hattic speakers, but continued to use the language in religious texts.

Figure 3. Languages of Ancient Anatolia (after Watkins 2001: 50)

All existing Hattic texts are found in Hittite cuneiform tablets as part of larger inscriptions in the Hittite language. Hence the Hattic language is known to us only fragmentarily, primarily in terms for architecture (e.g. 'house'), kingship (e.g. 'ruler') and theology (e.g. 'earth').

Of the few hundred texts which incorporate Hattic about 15 are bilingual with translation into Hittite, which has allowed for the meanings of some words and word complexes to be deduced. The major contributor to the known Hattic vocabulary is Oğuz Soysal

(2003, 2018). A recent compilation of Hattic words and word complexes is available from Gianfranco Forni (2019).

Typological Similarities to NWC

Early investigations of Hattic by Emil Forrer (1919: 1033-1034) and Robert Bleichsteiner (1923: 102-106) noted the possible relationship of Hattic to Northwest Caucasian languages, due largely to structural, rather than lexical, similarities. Further structural similarities were subsequently reported by Dunaevskaya (1960), Diakonov (1967: 170-176), Ardzinba (1979), Chirikba (1996) and others.

In addition, Diakonoff & Starostin (1986: 2,97), Ardzinba (1979), Braun (1994: 352-357), Chirikba (1996: Chapter XI) and Tikhonova (2016) identified correspondences in lexical affixes of Hattic and West Caucasian. Ivanov (1985) proposed many Hattic-Northwest Caucasian parallels in both radical and affixal morphemes.

External relations

The genetic relationship of Hattic to surviving language families is controversial and likely to continue to be so, in light of the paucity of Hattic material. Despite that, detailed cases for plausible paths of evolution have been drawn. Chirikba (1996: Chapter XI) posits a strong genetic relationship between Hattic and NWC languages from Proto Northwest Caucasian (Common West Caucasian in his terminology).

Chirikba (1996: 430-431) observes:

 "Even the scarce Hattic material, which is currently at our disposal, together with the obvious structural similarity of Hattic and West Caucasian, allows us to suppose with a rather high degree of certainty a genetic relationship between this long extinct language and the modern Abkhazo-Adyghean languages"

"First, must Hattic be regarded as the oldest attested West Caucasian dialect or should we speak rather in terms of Hattic-West Caucasian unity, much in the way as some linguists place Hittite in relation to the rest of the Indo-European languages?"

These questions remain unanswered and most likely will stay that way until we know reliably more about Hattic.

Kassian (2010) views Hattic and the Northwest Caucasian languages as more distantly related. In Kassian (2010: 415) he posits that Hattic derives (directly or indirectly) from a yet earlier proto language, "North Caucasian-Yenisserian." Also descending from North Caucasian-Yenisserian is North Caucasian, which in turn is the progenitor of the Northwest Caucasian languages as well as Northeast Caucasian languages (such as Lezgien, Udi and Chechen). Kassian (2010: 314) estimates that the Proto-North Caucasian split into East Caucasian and West Caucasian branches ca. 3800 BC. And in turn West Caucasian split into Abkhaz-Abaza, Ubykh and Circassian (Adyghe-Kabardian) ca. 640 BC.

In contrast, few linguists consider the genetic relationship of Hattic and Northwest Caucasian to be established. Prominently, Goedegebuure (2010) asserts that Hattic must still be considered isolate for all practical purposes.

1c. Population Genetic Data

Limited information about the relevant population genetics of the homelands of the Hattic and Northwest Caucasian languages is available, but King (2004) has said that Y-chromosome marker "M201 reaches a peak frequency in the NW Caucasus and in the Hattic/Kaska regions of Anatolia." As reported in Cinnioglu (2003), populations that speak Northwest Caucasian languages show a high frequency of Y chromosome haplogroup G-M201 (Nasidze et al. 2003). Haplogroup G-M201 lineages occur at about 30% in Georgia (Semino et al. 2000a) and the North Caucasus (Nasidze et al. 2003). Haplogroup G-M201 also occurs in Southeast Europe and the Mediterranean (Semino et al. 2000a) and in Iraq (Al-Zahery et al. 2003). In a material context, the Bronze Age Hattic and Kaska cultural region in Anatolia (Fig. 1) has affinity to the Maikop culture of the Caucasus.
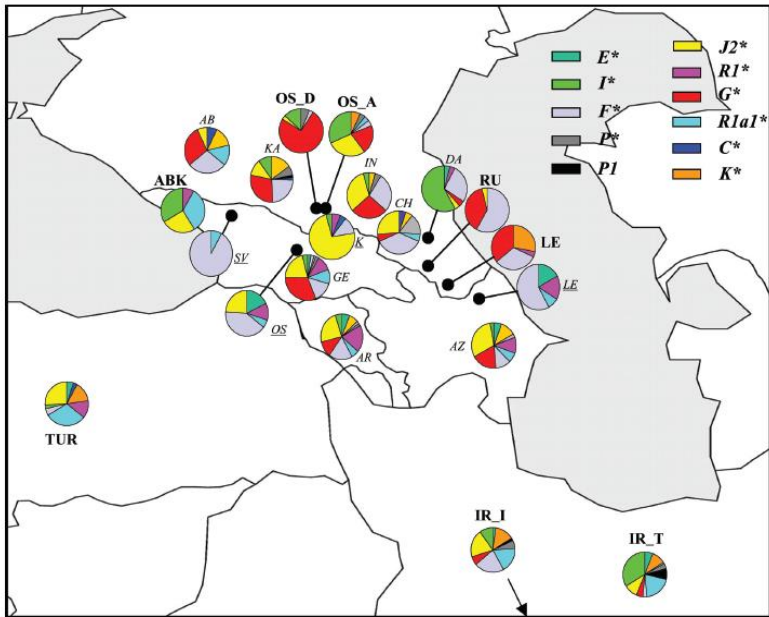
Figure 1 Map of the Caucasus showing the Y-SNP haplogroup frequencies. AB – Abazinians, Abk – Abkhazians, Ar – Armenians, Az – Azerbaijanians, Ch – Chechenians, Da – Darginians, Ge – Georgians, In – Ingushians, K – Georgians from Kazbegi, Ka – Kabardinians, Le_Az – Lezginians from Azerbaujan, Le_Dag – Lezginians from Dagestan, Os – South Ossetians, Os_A – Ossetians (Ardon), Os_D – Ossetians (Digora), Ru – Rutulians, Sv – Svans, Tur – Turks, Ir_I – Iranians (Isfahan), Ir_T – Iranians (Tehran). Population names in boldface are from the present study, in italic from Nasidze et al. (2003), and in underlined italic from Wells et al. (2001).

Figure 4. Y-SNP haplogroup frequencies in the Caucasus – from Nasidze et al, (2004) Mitochondrial DNA and Y-chromosome variation in the Caucasus. Annals of Human Genetics. 68: 205-221.

2. Method

The approach in this project is to establish a core vocabulary list, examine the similarities of words across languages to define classes of look-alike words, and recode the look-alikes as character states for phylogenetic analysis.

A core vocabulary list was drawn up for the five NWC languages and Hattic. This list was augmented with Turkish as an outlying language to root the resulting phylogenetic trees. A phylogenetic tree is composed of branches which represent taxa (in our case languages) that exist today and that we can actually examine. The

internal notes represent ancestral taxa, whose properties we can infer from the existing taxa.

The core vocabulary comprises a list of basic words learned during early childhood which are those that are the least likely to be borrowed or recently coined. This approach to determining the closeness of the relationship between languages was developed by Morris Swadesh (1955). There exist a variety of Swadesh lists, typically comprising 100 or 200 words chosen to be basic to any language. These include concepts such as body parts, words for day, night, sun and moon, or the first few cardinal numbers. The assumption is that any language would have these words natively, so they are unlikely to be borrowed and most likely to be descended from the protolanguage.

2a. Linguistic Resources

The starting point for constructing the core vocabulary list for the five NWC languages was the machine-readable version of the Nikolayev and Starostin North Caucasian Etymological Dictionary (NS 1994). This resource lists 814 reconstructed roots of proto-NWC with transcriptions of derived words in the five NWC languages, and notes on the reconstruction. These reconstructions are not without controversy (see Nichols 1997).

The machine readable data are supplied in a proprietary format which is read by a computer program (Star4Win) which is available from the "Tower of Babel" Evolution of Human Languages Project (http://starling.rinet.ru). This software is capable of editing the machine readable North Caucasian Etymological Dictionary and of limited glotto-chorological analysis. Further explanation of the uses of Star4Win is provided in (Abromeit et. al. 2016).

After initial editing of the data using Star4Win, a set of 193 words was exported to a Microsoft Excel spreadsheet. The data were preserved in the proprietary "Times New Roman Star" font, which can be installed on a Windows PC by the program found at http://starling.rinet.ru/download/ttffonts.EXE

The word forms from Nikolayev and Starostin (1994) were checked and extended by reference to Chirikba (1996) for the five NWC languages. Further references for Abaza were consulted in Ekba (1956) and Adzınov (1967). Additional references for

Kabardian were found in Kuipers (1975), Çelikkıran (1991) and Alhas (2005). References for Ubykh were consulted in Vogt (1963). Soysal (2003) was the primary reference for Hattic.

2b. Character States

The procedure followed was to group the words of sufficient phonetic similarity as look-alike sets. The groups of look-alikes were recoded as character data for analysis.

Table 1 shows a small example of words which may be "look-alikes". 'Water' appears to have one look-alike form in all of the languages considered. 'Big' seems to have similar forms in Kabardian and Adyghe, and another form in Abaza and Abkhaz.

Gloss	KAB	ADY	UBK	ABX	ABA	Hattic
big	jən	jənə	G'əʒa	mgwa	mgwa	
water	psə	psə	bzə	ʒə	ʒə	
mountain	bɣə	q:wəs'ha	ɬaxa	ʃxa	xwa	ziš

Table 1. Swadesh list words in five NWC languages and Hattic

These are re-coded in a form which can be analyzed by a tree-building program. The data of this form can be entered in a text editor and saved in NEXUS file format, which is then readable by many of the available phylogenetic tree building computer programs.

Gloss	KAB	ADY	UBK	ABX	ABA	Hattic
big	1	1	0	2	2	
water	1	1	1	1	1	
mountain	1	2	3	3	3	4

Table 2. Hypothesized character data for the words in Table 1

2c. Phylogenetic Analysis

Phylogenetic analysis of the 193-word list was performed with PAUP* 4.0 (D. Swofford, http://paup.csit.fsu.edu/). PAUP* is a computer program written by David Swofford specifically designed for creating phylogenetic trees. It implements several algorithms, including Neighbor Joining, for creating trees. Neighbor Joining

(Saitou and Nei, 1987) is a standard distance-based reconstruction method which does not require that all lineages have diverged by equal amounts. The method is especially suited for datasets comprising lineages with largely varying rates of evolution.

Separate phylogenetic trees were constructed using the Neighbor Joining technique. Analysis was performed for the NWC languages and Turkish with and without Hattic. Graphic diagrams of trees were generated with the TreeSetViz tree visualization tool (Amenta et al. 2003).

3. Results

This section presents the output of the phylogenetic analysis as trees and tables

Phylogeny

Phylogenetic trees were constructed with PAUP* 4.0 by the Neighbor Joining technique, based upon a list of 193 words. Two trees were constructed for the Northwest Caucasian Languages, with and without Hattic. In each case Turkish language was included as an out-group.

Tree Excluding Hattic

An unrooted tree was generated by the Neighbor Joining method, using PAUP*. The optimality criterion was distance, defined as mean character difference. Ties (if encountered) were broken randomly (with initial seed for the random number generator set to zero). All characters were of equal weight and were of type "unordered". Of 193 characters, 4 were constant, 65 variable characters were parsimony uninformative and 124 characters were parsimony informative.

The output was a log file and tree. Relevant extracts from the log file are shown in Figure 5 (Phylogram), Table 3 (Branch lengths and linkages), Table 4 (Pairwise distance between the languages), and Figure 6 (Graphical display of the tree in radial form).
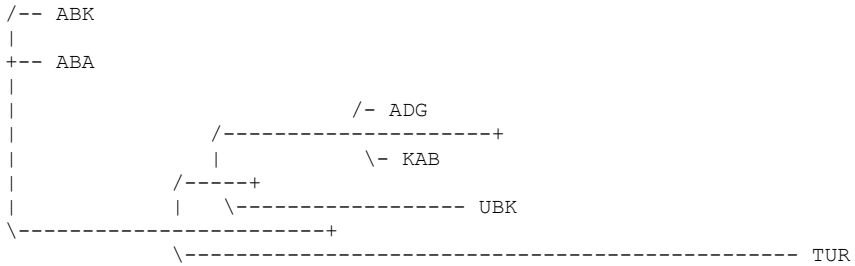
```
                                       Northwest Caucasian languages and Hattic

/-- ABK
|
+-- ABA
|
|                                    /- ADG
|                    /--------------------+
|                    |                    \- KAB
|              /-----+
|              |     \----------------- UBK
\----------------------+
               \--------------------------------------------- TUR
```

Figure 5. Phylogram of unrooted Neighbor Joining tree excluding Hattic, based on
193 characters

Node	Connected to node	Branch length
ABK (1)	10	0.02636
ABA (2)	10	0.02098
9	10	0.34041
8	9	0.07916
7	8	0.29698
ADG (3)	7	0.00962
KAB (4)	7	0.01727
UBK (5)	8	0.22192
TUR (6)	9	0.62157
Sum		**1.63426**

Table 3. Branch lengths and linkages of Neighbor Joining tree excluding
Hattic, based on 193 characters. Minimum evolution score is 2.00495

		ABK	ABA	ADG	KAB	UBK	TUR
1	ABK	-	0.04734	0.76608	0.77059	0.64935	0.98286
2	ABA	8	-	0.76923	0.77381	0.61589	0.98844
3	ADG	131	130	-	0.02688	0.52147	0.97872
4	KAB	131	130	5	-	0.54321	0.97849
5	UBK	100	93	85	88	-	0.98773
6	TUR	172	171	184	182	161	-

Table 4. Pairwise distances between taxa of Neighbor Joining tree
excluding Hattic, based on 193 characters. Total character differences
are shown below the diagonal. Mean character differences adjusted for
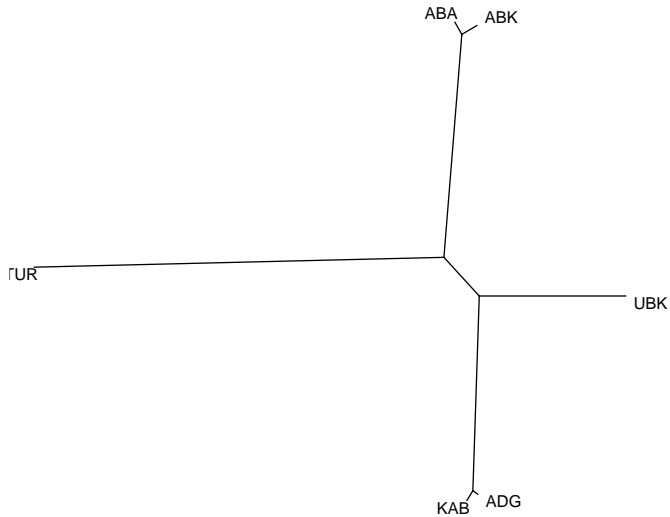missing data are shown above the diagonal.

Figure 6. Radial display of un-rooted Neighbor Joining tree excluding Hattic, based on 193 characters

Tree Including Hattic

The same Neighbor Joining technique used above was applied to the data augmented with the data for the Hattic language. Missing Hattic characters were indicated to the program with the character "?". The results are as follows in Figure 7 (Phylogram), **Hata! Başvuru kaynağı bulunamadı.** (Branch lengths and linkages), **Hata! Başvuru kaynağı bulunamadı.** (Pairwise distance between the languages), and Figure 8 (Graphical display of the tree in radial form).
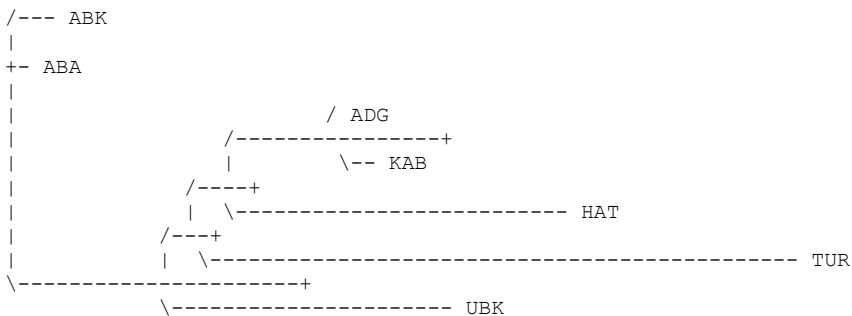
```
/--- ABK
|
+- ABA
|
|                            /  ADG
|                 /----------------+
|                 |            \-- KAB
|           /----+
|           |  | \------------------------ HAT
|        /---+
|        |  | \------------------------------------------ TUR
\----------------------+
           \--------------------- UBK
```

Figure 7. Phylogram of unrooted Neighbor Joining tree including Turkish and Hattic, based on 193 characters

Node	Connected to node	Branch length
ABK (1)	12	0.03415
ABA (2)	12	0.01318
11	12	0.34657
10	11	0.03052
9	10	0.07816
8	9	0.24211
ADG (3)	8	-0.00244
KAB (4)	8	0.02932
HAT (6)	9	0.34701
TUR (7)	10	0.62154
UBK (5)	11	0.26238
Sum		**2.00251**

Table 5. Branch lengths and linkages of Neighbor Joining tree including Turkish and Hattic, based on 193 characters. Minimum evolution score is 2.00495.

		ABK	ABA	ADG	KAB	UBK	HAT	TUR
1	**ABK**	-	0.04734	0.76608	0.77059	0.64935	0.83333	0.98286
2	**ABA**	8	-	0.76923	0.77381	0.61589	0.75000	0.98844
3	**ADG**	131	130	-	0.02688	0.52147	0.53846	0.97872
4	**KAB**	131	130	5	-	0.54321	0.66667	0.97849
5	**UBK**	100	93	85	88	-	0.83333	0.98773
6	**HAT**	10	9	7	8	10	-	1.00000
7	**TUR**	172	171	184	182	161	13	-

Table 6 Pairwise distances between taxa of Neighbor Joining tree including Turkish and Hattic, based on 193 characters. Total character differences are shown below the diagonal. Mean character differences adjusted for missing data are shown above the diagonal.
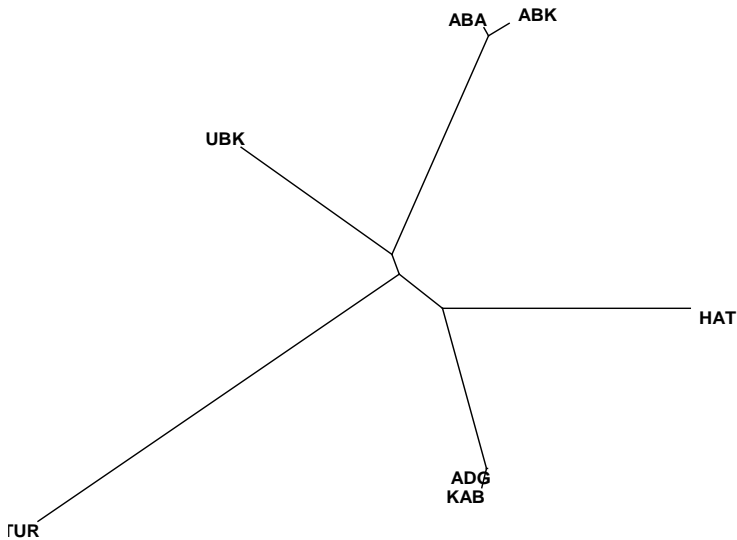
Figure 8. Radial display of un-rooted Neighbor Joining tree including Turkish and Hattic, based on 193 characters

4. Discussion

The results of this study are preliminary, both because the data needs further refinement and more understanding of the analysis techniques is required. However, the gross characteristics of the results are in line with expectations. The NWC languages are seen to cluster into Adyghe-Kabardian and Abkhaz-Abaza groupings, with Ubykh somewhat in the middle. In pair-wise comparison Adyghe and Kabardian are approximately equi-distant from Ubykh and Hattic.

Chrikba (1996) in his examination of the basic vocabulary from Swadesh's 200 wordlist shows greater closeness of Ubykh to Abkhaz than to Circassian. He tentatively suggested that initially Common West Caucasian was divided into Abkhaz-Ubykh and Circassian and then Abkhaz and Ubykh split. Later Ubykh underwent strong and continuous Circassian influence, which made for their uniformity.

Some further observations follow.

4a. Linguistic Data

Characters were based on look-alike sets. In the course of finding the look-alike sets some consistent sets of sound correspondences were observed. These are tabulated in Table 7.

ABK	ABA	ADY	KAB	UBK	*HAT*
h^w	h^w	χ^w	χ^w	χ^w	
k^w	k^w	x	x		
		d	t		
		ʃ	f		
		ʃ'	f'		
		x	x		*h*
χ^w	q^w			q^w	
χ	q			k^w	
χ	q			x	
χ^w	q^w			t^w	
p	*p*	*p*	*b*	*p*	

Table 7. Consistent sound correspondences found in NWC languages and Hattic

The characters were coded as multi-valued states. There is some controversy over the use of multi-valued character states (Poser 2004).

Dunn et al (2005) argue that grammatical features are more stable than lexicon and are better suited as characters for establishing long time horizon relationships between languages. The supplementary material for Dunn et al (2005) list 125 binary valued grammatical characters which were used in their study. These range from, e.g.

1. Fricatives: 1, No phonemes for which a fricative is the major realization; 0,One or more fricative phonemes to

125. Noun reduplication: 1, present; 0, absent.

Grammatical characters were not included in the present study.

5. Conclusion

Lists of core vocabulary words were compared for the five Northwest Caucasian languages, Hattic and Turkish (as an outlier language). Character states were decided on the basis of look-alike words, bearing in mind the known sound changes. These character states were used to construct phylogenetic trees by the Neighbor Joining method.

In agreement with traditional linguistic analysis, the Northwest Caucasian languages were seen to pattern with Adyghe-Kabardian and Abkhaz-Abaza as tight clusters which are well separated from each other, and with Ubykh somewhat in the middle. The outlier Turkish language is seen at the largest remove from these languages. The addition of Hattic showed this ancient Anatolian language at a remove from each of the Northwest Caucasian languages, with Turkish again at the greatest distance.

The present results should not be over-interpreted as the data comprised only a limited subset of the vocabulary of Hattic. Further, much of the linguistic support for a genetic relationship between Hattic and the Northwest Caucasian languages stems from structural, rather than lexical, similarities. Inclusion of grammatical and other typological features in the character sets which are the input to phylogenetic analysis, and further exploitation of increasingly sophisticated computational methods support a reasonable hope that computational phylogenetic analysis will, in future, contribute to uncovering the relationship of Hattic to Northwest Caucasian languages.

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