

Vedic Accents

This introductory document describes accents in the popular vedic traditions (ṛg veda śākhās and taittirīya śākhā). It assumes that the reader is able to chant a few mantras from an accented text.

Four sounds in vedic texts

गुणानां॑ वा गुणपतिम्॑

There are four primary sounds heard in vedic mantras, exemplified in the famous verse gaṇānām tvā ...

Accent	Marking	Example	Pitch
anudātta	underbar	गु, गु	Low
udātta	none	णा, वा, ण, तिम्	Normal
svarita	overbar	पं	High
dīrgha svarita	double overbar	नाम्	Normal + High

Primary udāttas

Technically, not all vowels of the middle pitch are udāttas. Some vowels are true independent udāttas. Others happen to be anudāttas which are pronounced like udāttas after some accent changes.

Primary independent udāttas which cause accent changes in other vowels are udāttas. Secondary dependant anudātta accents, which happen to be pronounced just like a udātta after some accent changes are called pracaya.¹

A true udātta causes the vowel that precedes it to be pronounced with a lower pitch. It also causes the vowel that follows it to be pronounced with a higher pitch. There are some exceptions, but one of the two is almost always true.

Let us look at our example once again, focusing on all the udāttas (vowels of normal pitch which are unmarked in the main text). Let us try to determine if these are udāttas or pracayas.

¹ Other variants such as sannatara accents are omitted here.

ग॒णानां॑ वा ग॒णप॑तिम्

Preceded by	Normal Pitch Vowel	Followed by	Normal pitch preceded by low pitch, OR normal pitch followed by high pitch?	Accent
ग॒	णा	नाम्	✓	udātta
नाम्	वा	ग॒	✗	pracaya
ग॒	ण	प॑	✓	udātta
प॑	तिम्		✗	pracaya

The true independent udātta is the key to the vedic accent system. Starting from the udātta, we can accent the remainder of the text according to the following two primary rules, applied in order:

1. All unmarked non-udatta vowels that immediately precede the udātta are to be marked as anudātta (underbar)
2. All remaining unmarked non-udatta vowels that immediately follow the udātta are changed to a svarita and marked appropriately (overbar)

Step	Text (primary udātta in red)
0	ग॒णानां॑ वा ग॒णप॑तिं हवामहे
1	ग॒णानां॑ वा ग॒णप॑तिं हवामहे
2	ग॒णानां॑ वा ग॒णप॑तिं हवामहे

(Note: long vowel svaritas like “ṛā” often become become dīrgha svaritas. This is described later)

Let us take another example:

Step	Text (primary udātta in red)
0	क॒विं क॒वीना॑मुप॒मश्र॑वस्तमम्
1	क॒विं क॒वीना॑मुप॒मश्र॑वस्तमम्

2	क॒विं क॑वी॒नामु॑प॒मश्र॑वस्तमम्
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The next example requires one additional step

3. After applying steps 1 and 2, any leading unmarked non-udatta vowels are marked as anudatta. (i.e. starting from the beginning, mark all vowels as anudatta with an underbar until you reach the first marked vowel, or until you reach the first unmarked udatta)

Step	Text (primary udatta in red)
0	ज्येष्ठ॒राजं॑ ब्रह्म॒णां ब्रह्म॑णस्पत् आ नः शृ॒ण्वन्नृ॑तिभिः सीद सादनम्
1	ज्येष्ठ॒राजं॑ ब्रह्म॒णां ब्रह्म॑णस्पत् आ नः शृ॒ण्वन्नृ॑तिभिः सीद सादनम्
2	ज्येष्ठ॒राजं॑ ब्रह्म॒णां ब्रह्म॑णस्पत् आ नः शृ॒ण्वन्नृ॑तिभिः सीद सादनम्
3	ज्येष्ठ॒राजं॑ ब्रह्म॒णां ब्रह्म॑णस्पत् आ नः शृ॒ण्वन्नृ॑तिभिः सीद सादनम्

Accent Summary

Let us summarize what we have seen thus far:

Step	Accents
0	The text consists of independent udattas in red. Everything else was an anudatta.
1	Unmarked anudattas which preceded an udatta were marked with an underbar.
2	Unmarked anudattas which followed an udatta were changed to svarita and marked with an overbar.
3	All leading anudattas in the text were marked with an underbar

Note: All unmarked anudattas that followed a svarita (after step 2) were left as is. i.e. they are pracaya accents, and are pronounced just like udattas.

Exercises

Determine the final form for each of the mantra selections below:

1. नमः शिवाय ॥

2. नमस्ते रुद्र ॥

3. सहस्रशीर्षा पुरुषः । सहस्राक्षः सहस्रपात् ॥

4. भर्गो देवस्य धीमहि ॥

5. सर्वो वै रुद्रस्तस्मै रुद्राय नमो अस्तु ।

6. ॐ शान्तिः शान्तिः शान्तिः ॥

Accents and svaha

स्वाहा

Many sādhakas perform homa (or other agni-kārya) with vedic mantras, by adding svāhā to the mantra. In these cases, the same svara rules that we have seen thus far will apply. No new rules are required ² ! From the perspective of “adding svāhā”, we can restate what we know:

- If the vowel that precedes the word svāhā was an anudātta that changed to a svarita or udātta, it will change back to an anudātta.

Note: It follows that independent svaras (like udātta) will remain unchanged.

Examples:

होतारं रत्नधातमम्	होतारं रत्नधातमं स्वाहा
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In the example above, “ma”³ must have been an anudātta. If it was originally an udātta, the vowel that precedes it (i.e. “ta”) would have become an anudātta. Since it was originally an anudātta, it will once again become an anudātta before “svaahā”.

अत्यतिष्ठदशाङ्गुलम्	अत्यतिष्ठदशाङ्गुलं स्वाहा
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In the example above, “la” must have originally been an udātta. Thus, the vowel that precedes it (gu) has become an anudātta. An independent udātta will not change, and “la” remains as it before “svāhā”.

² Again, the long vowel svarita “hā” here has become a dīrgha svarita. This is described later.

³ Accents only apply to vowels. Thus, in “ma”, we are only referring to “a”. For clarity, the consonant that precedes it is also shown within the quotes.

स॒भाप॑तिभ्यश्च वो॒ नमः॑

स॒भाप॑तिभ्यश्च वो॒ नमः॑ स्वाहा॑

In the example above, “na” is an udātta and “ma” was an anudātta which changed to a svarita. Thus, “ma” will change back to an anudātta before “svāhā”.

Splitting a mantra

Let us look at one of the mantras from the rudra praśna:

नमो॑ हिर॑ण्यबाहवे सेना॒न्ये दि॒शां च॒ पत॑ये नमो॑ नमो॑ वृ॒क्षेभ्यो॑ हरि॑केशेभ्यः पशू॒नां पत॑ये नमो॑
नमः॑ स॒स्मिञ्ज॑राय॒ त्रिषी॑मते पथी॒नां पत॑ये नमो॑ नमो॑ बभ्रु॒शाय॑ विव्या॒धिनेऽन्ना॑नां पत॑ये नमो॑ ...

The taittirīya śākhā consists of many long anuvākas such as the one above. If we are unable to chant them in a single breath, and pause inbetween, we must also make sure to change the svaras accordingly. For example, the portion above is commonly thought to contain four separate mantras, as shown below:

नमो॑ हिर॑ण्यबाहवे सेना॒न्ये दि॒शां च॒ पत॑ये नमो॑

नमो॑ वृ॒क्षेभ्यो॑ हरि॑केशेभ्यः पशू॒नां पत॑ये नमो॑

नमः॑ स॒स्मिञ्ज॑राय॒ त्रिषी॑मते पथी॒नां पत॑ये नमो॑

नमो॑ बभ्रु॒शाय॑ विव्या॒धिनेऽन्ना॑नां पत॑ये नमो॑ ...

Each mantra ends with a “namo”, and we know that the “na” is an independent anudātta (since it is preceded by an anudātta “ye”). Actually, the final word is “namaḥ” which has changed to “namo” due to standard Sanskrit sandhi rules. Thus, if we want to split this into 4 separate mantras, or we wish to take a breath while chanting this long mantra, we chant:

नमो॑ हिर॑ण्यबाहवे सेना॒न्ये दि॒शां च॒ पत॑ये नमः॑ ॥

नमो॑ वृ॒क्षेभ्यो॑ हरि॑केशेभ्यः पशू॒नां पत॑ये नमः॑ ॥

नमः॑ स॒स्मिञ्ज॑राय॒ द्वि॒षी॑मते प॒थी॒नां प॑त॒ये नमः॑ ॥

नमो॑ ब॒भ्रु॒शाय॑ वि॒व्या॒धि॒नेऽन्ना॑नां प॒त॒ये नमः॑ ॥

Thus, the accent has changed from an anudātta to an udātta. Many vedic scholars always split these long anuvakas in this way in order to avoid svara related mistakes.

Part 2: vikṛtis and advanced accents

Vikṛtis

After learning the primary saṁhitā text, vedic scholars learn different patterns of the text.⁴ The most popular patterns are shown below:

Name	Textual Pattern	Visualization	Note
saṁhitā	1234 ...		
pada	1 2 3 4 ...		
krama	12 23 34 ...	1 2	The first part of krama is pada
jaṭā	122112 233223 344334 ...	1 2 2 1 1 2	The first part of jatha is krama
ghana	1221123321123 2332234432234 ...	1 2 2 1 1 2 3 3 2 1 1 2 3	The first part of ghana is jatha

The saṁhitā, pada and krama patterns are “natural” patterns, because the text is always read in a forwards direction (i.e. from left to right). The jaṭha and ghana patterns are “artificial” patterns, because the text is read both forwards and backwards.

Note: it is commonly known that word order does not matter in Sanskrit. This is only partially true, and there are many cases in which word order does matter. One simple example is given below:

अहम् एव गणपतिं नमामि	Only I salute Gaṇapati
अहं गणपतिम् एव नमामि	I salute only Gaṇapati
अहं गणपतिं नमामि एव	I do indeed salute Gaṇapati

Back to the topic at hand, let us look at how the variations works with the textual portion “havāmahe kavim kavīnām” from our example mantra. From the patterns described earlier, we’ve simply replaced 1 with “havāmahe”, 2 with “kavim” and 3 with “kavīnām”. With this particular selection, there are no mandatory sandhi rules, which makes this exercise relatively simple.

⁴ From pada pāṭha onwards, there are also some additional features (e.g. the components of compound words are shown). These are described later.

sarṁhitā	हवामहे कविं कवीनाम् ।
pada	हवामहे । कविम् । कवीनाम् ।
krama	हवामहे कविम् । कविं कवीनाम् ।
jaṭā	हवामहे कविं कविं हवामहे हवामहे कविम् । कविं कवीनां कवीनां कविं कविं कवीनाम् ।
ghana	हवामहे कविं कविं हवामहे हवामहे कविं कवीनां कवीनां कविं हवामहे हवामहे कविं कवीनाम् ।

Accents and vikṛtis

The accent rules that we have studied apply to all the variations (like krama, jaṭha etc). Starting with the modified texts, you can yourself apply the rules listed earlier to get to the final text below.

sarṁhitā	ह॒वाम॒हे क॒विं क॑वी॒नाम् ।
pada	ह॒वाम॒हे । क॒विम् । क॒वी॒नाम् ।
krama	ह॒वाम॒हे क॒विम् । क॒विं क॑वी॒नाम् ।
jaṭha	ह॒वाम॒हे क॒विं क॒विं ह॑वामहे हवामहे क॒विम् । क॒विं क॑वी॒नां क॑वी॒नां क॒विं क॒विं क॑वी॒नाम् ।
ghana	ह॒वाम॒हे क॒विं क॒विं ह॑वामहे हवामहे क॒विं क॑वी॒नां क॑वी॒नां क॒विं ह॑वामहे हवामहे क॒विं क॑वी॒नाम् ।

Jātya svarita

Until now, every svarita that we have seen was an anudāṭṭa that changed to a svarita because it immediately followed an udāṭṭa. However, some svaritas are formed differently.

The jātya svaritas which are easiest to recognize are those at the beginning of a sentence, and those that immediately follow an anudāṭṭa (see the first two examples below). We cannot generate such svaritas with the rules that we have seen thus far, because they are not immediately preceded by udāṭṭa.

Rule #1: udāṭṭa + anudāṭṭa which results in yaṅ sandhi (y,r,l,v) results in jātya svarita known as kṣaipra

त्रि + अ॒म्ब॒क॒म्	त्र्य॑म्बकम्
अ॒वि॒त्री + अ॒व॒तु	अ॒वि॒त्र्य॑वतु

Rule #2: udāṭṭa + anudāṭṭa (replaced by single vowel) results in jātya svarita known as praśliṣṭha

द्वि॒वि + इ॒व	द्वि॑र्विव
न + ए॒व	नै॑व

Rule #3: udāṭṭa + anudāṭṭa resulting in avagraha results in jātya svarita known as abhinihita⁵

ये + अ॒न्तरि॑क्षे	येऽन्तरि॑क्षे
यः + अ॒स्मान्	योऽस्मान्

Sometimes the jātya svarita is a part of a single word (having occurred in the formation of the word itself). Thus, it need not be the result of word combinations.

क्व॑ स्वि॒दस्याः॑ प॒र॒मं ज॑गाम ।

त॒न्वा॑म॒हे ।

⁵ Note: the svarita in the examples below along happens to be elongated as described in a later section

Note: in the taittirīya tradition, all svaritas (jātya or non-jātya) are rendered in the same way. In the ṛg veda tradition, the pronunciation of the kṣaipra and praśliṣṭha svarita accents differ. Thus, they are also marked differently in the texts, as shown below:

म॒क्षु + इ॒त्था	म॒क्ष्वि॑त्था
न + ए॒व	नै॑व

Elongated svarita

In the ṛg veda style, any svarita on a long vowel is pronounced as a dīrgha svarita (double bar).

The taittirīya style is more restrictive. The dīrgha svarita occurs under any of the following conditions:

1. a long vowel dependent svarita is followed by a conjunct letter

ग॒णानां॑ ब्वा ग॒णप॑तिं हवामहे ॥

नमः॑ ककुभाय॑ निष॒ङ्गि॑न् स्ते॒नानां॑ पत॑ये नमः॑ ॥

यै॑ऽन्तरि॑क्षे

पादौ॑ऽस्य॒ विश्वा॑ भू॒तानि॑ ॥

2. a long vowel dependent svarita is followed by a visarga

वि॒ष्णोः॑ पृ॒ष्ठम॑सि ॥

नील॑ग्रीवाः शि॒ति॒क॒ण्ठाः॑ श॒र्वा अ॒धः क्ष॑माच॒राः ॥

निव॑पन्तु से॒नाः ॥

वाच॑ गन्ध॒र्वाः प॒शवो॑ मनु॒ष्याः॑ ॥

3. a long vowel dependent svarita occurs at the end of the phrase

नमस्ते अस्त्रायुधायानां तताय धृष्णवे ॥

वाचं देवा उपजीवन्ति विश्वे ॥

4. a short vowel dependent svarita occurs at the end of the phrase, followed by an anusvāra

पुरुष एवेदं सर्वम् ॥

यद्भूतं यच्च भव्यम् ॥

The word “svāhā” is elongated because it is usually found at the end of a phrase. And when this is not true, it loses its elongation in the taittirīya tradition as shown below:

मृत्यवे स्वाहा मृत्यवे स्वाहा ॥

Features of the pada pāṭha

In the pada, krama and ghana readings, there are additional lines, which do not follow the pattern described earlier. These can be identified by the presence of the word “iti”. For example, the taittirīya “gaṇānām tvā” mantra has these extra lines:

गणपतिमिति गण-पतिम्	“gaṇapatim” is a compound word consisting of “gaṇa” and “patim”
उपमश्रवस्तममित्युपमश्रवः-तमम्	describes the internal formation of the single word “upamaśravastamam”
ज्येष्ठराजमिति ज्येष्ठ-राजम्	“jyeṣṭharājam” is a compound word consisting of “jyeṣṭha” and “rājam”
ऊतिभिरित्यूति-भिः	describes the internal formation of the single word “ūtibhiḥ”
सादनमिति सादनम्	“sādanam” is the last word in the mantra

The primary purpose of these extra lines in the pada-pāṭha is to describe some compound words like “gaṇapatim” and the end of mantra markers like “sādanam”. In some cases, the internal formation of

words like “ūtibhiḥ” is also described. This is solely due to the peculiarities of the sanskrit derivational grammar⁶, and really doesn’t belong in the pada-pāṭha.

In all of these lines, the word is described twice on both sides of the word “iti”. On the left side, it is found as is. On the right side, it is divided into the two constituent parts. The word iti itself is accented as shown below:

इति

There are two styles of dividing words into two constituent parts. One style resets the svāra after the first constituent part (i.e. treats the second constituent part as a separate phrase). Another style does not reset the svāra, though it pauses between the words. This is shown below:

गुणपतिमिति गुण-पतिम्	गुणपतिमिति गुणऽपतिम्
उपमश्रवस्तमित्युपमश्रवः-तम्	उपमश्रवस्तमित्युपमश्रवःऽतम्

Sandhi rules also apply in the word division. For example:

पुरोहितमिति पुरः-हितम्	पुरोहितमिति पुरःऽहितम्
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The pada pāṭha also resets some of the liberties taken in the saṁhitā text. The text seen by a ṛṣi is always orrect. When it does not follow the popular pāṇinīyan grammar, it is understood as “ṛṣi’s privelege”. Some examples of this are below:

अथाते	अथ । ते ।
विद्वा हि ब्वा	विद्वा । हि । ब्वा ।
वरुणो मामहन्ताम्	वरुणः । म्महन्ताम् ।

⁶ In the formation of “ūtibhiḥ”, “ūti” is also considered to be a word according to pāṇini’s grammar.

Part 3: Critique & Discussion

Anusvāra changes (gum)

In the taittiriya style, the anusvāra changes to a different nasal before ś, ṣ, s, h and r⁷ and is heard like something resembling “gum”. For example:

अ॒यं + श्ना॒स्ता	अ॒यं॑ श्ना॒स्ता
	प्र ण॒ आयूँ॑षि
प्र॒जां + सौभा॑ग्यम्	प्र॒जां॑ सौभा॑ग्यम्
ग॒णप॑तिं + हवामहे	ग॒णप॑तिं॑ हवामहे
तं + रा॑जन्	तं॑ रा॑जन्

And when the anusvāra is also followed by a conjunct letter, a different symbol is used. This is pronounced like something resembling “gus”.

प॒शूँ॑स्तान्	प॒शूँ॑स्तान्
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However, this entire system of anusvāra replacements is flawed, because it has introduced a new vowel. This is crystal clear in modern typesetting like the following:

आयूँ॑षि	आयूँ॑षि
पिन्व॑न्न॒जरं॑ सु॒वीर॑म्	पिन्व॑न्न॒जरं॑ सु॒वीर॑म्

⁷ This is not exhaustive. For example, tathā lokā{n} akalpayan.

अतो ज्यायांश्च पूरुषः	अतो ज्यायांश्च पूरुषः
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In the first example above, the svarita has moved from “yū” to the newly introduced vowel. In the second example above, we see that the first “ra” no longer has a svarita ... it has also moved onto the newly introduced vowel. Even the final dīrgha svarita has subtly moved onto the anusvāra !

We can contrast this with a taittirīya tradition in mahārāṣṭra, where the same replacment occurs. However, typesetting puts the svāra on the vowels, i.e. the anusvāra is still treated like an anusvāra, and no new vowel is introduced.

आयूषि	आयूषि
पिन्वन्नजरं सुवीरम्	पिन्वन्नजरं सुवीरम्

Extra vowels

Since accents can only be rendered on vowels, we can find some common pronunciation problems by looking for places where an extra accent is added, or places where the accent shifts without justification.

सहस्रशीर्षा पुरुषः	सहस्रशीर्षा पुरुषः
इध्मश्च मे बर्हिश्च मे	इध्मश्च मे बर्हिश्च मे

As shown above, the repha (half-r) is sometimes pronounced as a stand alone consonant with its own vowel. It even gets it's very own accent in the second example !

तं यज्ञं बर्हिषि प्रोक्षन्	तं यज्ञं बर्हिषि प्रोक्षन्
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Similarly, the svarita accent on the last vowel of a phrase is often transferred to the following consonant (which is also duplicated). Unfortunately, this can only be pronounced along with a newly introduced vowel (usually an “a”).

नीलंभीवाः शितिकण्ठाः शर्वाः	निवंपन्तु सेनाः
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The same problem can also be seen with the dīrgha svarita on a visarga at the end of a phrase. There is a significant difference between the pronunciation of the visarga in the examples above. On the right hand side, an entire “a” or “ā” vowel is usually added after the visarga.

In all of these cases, an additional vowel has been introduced, and the common practice is to accent these new vowels ! This simply cannot be correct, as it would reflect a major inconsistency in the vedic accent system.

Comingling of recitation styles

It is quite common for adherents of a particular veda śākhā to use some mantras from another śākhā. This has given rise to a situation where the pronunciation follows neither the original śākhā nor the chanters śākhā !

अ॒यं मे॒ ह॒स्तो॒ भ॒ग॒वान॒यं॒ मे॒ भ॒ग॒व॒त्त॒रः॑ । अ॒यं मे॑ वि॒श्व॒भै॑ष॒जो॒ऽय॒श्चि॒वाभि॑म॒र्शनः॑ ॥

The mantra above is from the ṛg veda, and is commonly chanted along with the rudra praśna. The source is clear ... svaritas which are not followed by conjunct letters have been elongated. However, anusvāra replacement has occurred as well ! Another example is shown below:

तद्वि॒प्रा॑सो वि॒प॒न्य॒वो॑ जा॒गृ॒वा॒सुः॑ स॒मि॒न्ध॒ते । वि॒ष्णो॒र्य॒त्प॒र॒मं॑ प॒द॒म् ॥

This kind of partial adherence is unfortunate. It would be better to stick to either the original source chanting style, or completely adopt the target chanting style.

Note: the problem does not disappear by leaving the anusvāra as is. There are other differences in the chanting styles. For example, there is usually an elongation of the normal svarita of ṛg vedins when compared to the taittirīya rendering of the same passage.

Modern vedic texts

There are some vedic selections which don't follow the accent method described in this document, in spite of being attached to śākhās that follow this system. The simplest way to identify these selections is to look for a series of marked anudāttas in the middle of the text (i.e. they do not occur at the beginning of a phrase). For example:

nārāyaṇa sūkta	ना॒रा॒य॒णं॑ म॒हा॒ज्ञे॒यं॑ वि॒श्वा॒त्मा॑नं प॒रा॒य॑णम्
śrī sūkta	ग॒न्ध॒द्वा॒रां॑ दु॒रा॒ध॒र्षा॑ नि॒त्य॒पु॑ष्टां क॒री॒षि॒णी॑म्

Note: there is a less popular South Indian accented recension (drāviḍa pāṭha) of the śrī sūkta which does not have this problem.

Texts which have this feature have probably lost their accents. More than likely, an unaccented text was found, and the tradition was revived in the past. In time, normal śloka intonations have probably been mistaken for real vedic svaras.

Svaras and the 7 tones

	tone	note	taittirīya (theory)	taittirīya (practice)
1	ṣaḍja	sa		
2	ṛṣabha	ṛ	anudātta	anudātta
3	gāndhāra	gā	udātta	udātta / pracaya
4	madhyama	ma	pracaya	svarita
5	pañcama	pa	svarita	
6	dhaivata	dha		
7	niṣādha	ni		

The vedic system is composed of 7 equally spaced tones (from ṣaḍja to niṣādha), as heard in sāma veda śākhās. The taittirīya accent system is theoretically composed of four tones. Notably, the udātta and pracaya accents are said to be one tone apart, though they are indistinguishable in current traditions. The current taittirīya tradition is composed of only three tones.

Part 4: The various vikṛtis

In addition to pada and krama, eight popular vikṛtis of the saṁhitā text are given in the shloka below:

jaṭā mālā śikhā rekhā dhvajo daṇḍo ratho ghaṇaḥ .
aṣṭau vikṛtayaḥ proktāḥ kramapūrvō maharṣibhiḥ ..

Name	Samhitā	Pattern	Visualization	Note
pada	123...	1 2 3 ...	1	
krama	123...	12 23 ...	1 2	
jaṭā	123...	122112 233223 344334 ...	1 2 2 1 1 2	The first part of jatha is krama
mālā (krama)	123...	12 21 12 23 32 23 23 43 34 ...	1 2 2 1 1 2	jaṭha with breaks after each pair
sihkhā	123...	1221123 2332234 3443345 ...	1 2 2 1 1 2 3	jaṭha followed by the next word
ghana	123...	1221123321123 2332234432234 3443345543345 ...	1 2 2 1 1 2 3 3 2 1 1 2 3	The first part of ghana is jatha / sihkhā
mālā (puṣpa)	123...789	12 98 23 87 34 76 ... 78 32 89 21	12 98 23 87 34 76 ... 78 32 89 21	Forwards and backwards
dhvaja	123...789	12 89 23 78 34 67 ... 78 23 89 12	12 89 23 78 34 67 ... 78 23 89 12	Pairs, forwards and backwards
daṇḍa	12345...	12 21 12 23 321 12 23 34 4321 12 23 34 45 54321 ...	1 2 2 3 3 4 4 5 5 4 3 2 1	
rekhā	123456...	12 21 12 234 432 23 3456 6543 34 45678 87654 45 567890 098765 56		

ratha	12345678	12 56 21 65 12 56 23 67 321 765 12 56 23 67 34 78 4321 8765		simultaneous daṇḍa of two halves
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Taking the 4th word of a mantra, we find the following unique sequences:

Sequence Length	Sequence	Example vikṛti
1	4	pada
2	34 45 44 43 54	krama krama jaṭā jaṭā jaṭā
3	234 345 456 432 543 654	ghana ghana ghana ghana ghana ghana
4	3456 4321	rekḥā daṇḍa
5	45678 54321 654321...	rekḥā daṇḍa daṇḍa

samhitā

देवीं वाचमजनयन्त देवास्तां विश्वरूपाः पशवो वदन्ति ।

सा नो मन्द्रेषमूर्जं दुहाना धेनुर्वागस्मानुपसुष्टुतेतु ॥

padam

दे॒वीम् । वाच॑म् । अ॒ज॒न॒य॒न्त॒ । दे॒वाः । ताम् । वि॒श्वरू॑पाः । प॒श॒वः । व॒द॒न्ति॒ । सा । नः॑ ।
म॒न्द्रा । इष॑म् । ऊ॒र्ज॑म् । दुहा॑ना । धे॒नुः । वाक् । अ॒स्मान् । उप॑ । सु॒ष्टु॑ता । आ । ए॒तु॒
॥

mala

दे॒वीं वाच॑म् । वाचं॑ दे॒वीम् । दे॒वीं वाच॑म् ॥
वाच॑म॒ज॒न॒य॒न्त॒ । अ॒ज॒न॒य॒न्त॒ वाच॑म् । वाच॑म॒ज॒न॒य॒न्त॒ ॥

म॒ज॒न॒य॒न्त॒ दे॒वास्तां॑ वि॒श्वरू॑पाः प॒श॒वो॑ व॒द॒न्ति॒ ।

सा नो॑ म॒न्त्रे॑ष॒मूर्जं॑ दुहा॑ना धे॒नुर्वा॑ग॒स्मानु॑प॒सुष्टु॑तैतुं ॥

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