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Review Article

Shringagrahika Nyaya and Artificial Intelligence: A Conceptual Framework for Feature Identification and Knowledge Interpretation

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Abstract

Background: Ayurvedic classical literature preserves complex scientific knowledge through concise and aphoristic expressions, the interpretation of which frequently requires contextual reasoning and identification of representative features. Śṛṅgagrahika Nyāya, an interpretative principle employed by Chakrapāṇi Datta in the *Āyurveda Dīpikā* commentary on the *Charaka Saṃhitā*, illustrates the identification of a particular entity through a distinguishing or representative characteristic. Contemporary Artificial Intelligence (AI) similarly employs selective information processing, feature identification, pattern recognition, contextual interpretation, and explainable decision-making. **Objective:** To explore the conceptual relationship between Śṛṅgagrahika Nyāya and contemporary AI approaches and to propose a conceptual framework for its potential application in Ayurveda-oriented AI systems. **Materials and Methods:** A narrative conceptual review was undertaken through analysis of classical Ayurvedic literature, particularly the *Charaka Saṃhitā* with Chakrapāṇi Datta's *Āyurveda Dīpikā* commentary, along with contemporary literature related to feature selection, pattern recognition, attention mechanisms, knowledge representation, Natural Language Processing, clinical decision support systems and Explainable Artificial Intelligence. Classical applications of Śṛṅgagrahika Nyāya were examined and conceptually mapped with relevant AI methodologies. **Results:** Analysis of twelve classical applications demonstrated four major epistemological dimensions of Śṛṅgagrahika Nyāya: representative knowledge representation, knowledge compression with contextual inference, feature-based identification and prioritization and adaptive or individualized interpretation. These dimensions demonstrated conceptual correspondence with feature selection, pattern recognition, attention mechanisms, knowledge representation, context-aware processing and Explainable Artificial Intelligence. Based on these correspondences, potential applications were identified in AI-assisted interpretation of Ayurvedic classical texts, Ayurveda knowledge graphs and ontologies, clinical decision-support systems, Ayurvedic pharmacological knowledge analysis, and explainable Ayurveda-oriented AI. **Conclusion:** Śṛṅgagrahika Nyāya may be understood as a classical Ayurvedic epistemological framework emphasizing selective identification, representative reasoning, contextual interpretation, and logical explanation. Its conceptual correspondence with contemporary AI provides a novel interdisciplinary perspective for developing transparent, context-sensitive, and explainable AI applications in Ayurveda. However, the proposed relationship is conceptual rather than historical or technological, and computational implementation and empirical validation are required to establish its practical applicability.

Keywords: Śṛṅgagrahika Nyāya, Ayurveda, Artificial Intelligence, Feature Selection, Pattern Recognition, Explainable Artificial Intelligence, Knowledge Representation, Ayurvedic Epistemology

1. Introduction:

Ayurveda is one of the oldest systems of medicine in which scientific knowledge has been preserved in the form of concise and aphoristic verses (*Sūtras*). Recognizing the complexity of acquiring comprehensive knowledge from these classical treatises, Ācārya Charaka described **Adhyayana** (systematic study), **Adhyāpana** (teaching), and **Tadvidya-Sambhāṣā** (scholarly discussion) as the three fundamental methods for attaining profound understanding of Ayurveda.[1]

Similarly, Ācārya Suśruta emphasized **Satatādhyayana** (continuous study), **Vāda** (scholarly discussion), **Paratantrāvalokana** (study of allied sciences) and **Tadvidyācāryasevā** (learning under experienced preceptors) as essential means to enhance intellectual ability and retention of knowledge.[2] These classical principles indicate that the study of Ayurveda extends far beyond literal reading of the texts and demands continuous learning, critical reasoning, scholarly discussion and contextual interpretation.

The classical Ayurvedic treatises are composed according to the principle of **"Padairalpam Matibuddhatvam,"** wherein profound scientific concepts are expressed through a limited number of words without compromising their depth and applicability.[3]

Although this literary style ensures brevity and facilitates memorization, the intended meaning of many *Sūtras* cannot always be understood through literal translation alone, as their interpretation depends upon grammar, context, purpose and logical reasoning. To facilitate accurate interpretation of such concise expressions, Ayurvedic commentators employed various **Nyāyas** (logical maxims) as interpretative tools to explain implicit meanings, resolve ambiguity and preserve the original intention of the author.

A maxim is a concise statement that expresses a general principle or practical wisdom in a brief yet meaningful manner. Its defining characteristic is its brevity, whereby profound ideas are communicated through a few carefully chosen words without compromising their intended meaning.[4]

In classical rhetoric, maxims have traditionally been regarded as concise formulations for conveying common wisdom and explaining complex ideas through familiar analogies. Despite originating from practical observations or everyday experiences, many maxims have retained their relevance because of their universal applicability and interpretative value. In Ayurveda, Nyāyas serve as important epistemological and interpretative tools that facilitate contextual understanding, resolve ambiguity and enable readers to derive the intended meaning of the classical treatises. Rather than merely enhancing literary expression, Nyāyas provide a systematic framework for accurate interpretation and practical application of Ayurvedic concepts.[5]

Based on their origin and application, Nyāyas are broadly classified into **Laukika Nyāyas** (conventional maxims) and **Śāstrīya Nyāyas** (classical maxims).

Laukika Nyāyas are derived from common worldly experiences and are frequently employed in day-to-day communication, whereas Śāstrīya Nyāyas are primarily utilized for the interpretation and deeper understanding of classical literature.[6]

These interpretative principles function as conceptual frameworks that assist in organizing, analyzing, and applying the knowledge embedded within classical Ayurvedic literature. By enabling recognition of essential elements from extensive textual descriptions, Nyāyas facilitate meaningful interpretation without compromising the contextual depth of the original statements.

Among the numerous Nyāyas employed in Ayurvedic commentaries, **Śṛṅgagrahika Nyāya (SGN)** occupies a unique place in Chakrapāṇi Datta's *Āyurveda Dīpikā* commentary on the *Charaka Saṃhitā*.

The term *Śṛṅga* denotes the horn of a cow or ox, whereas *Grahika* implies grasping or holding for the purpose of identification.

Accordingly, Śṛṅgagrahika Nyāya illustrates the identification of a particular cow from a herd by holding its horn, thereby distinguishing it from other similar cows.

The central principle of this Nyāya is that when several entities possess similar characteristics, the intended entity can be accurately recognized through its distinguishing feature rather than by examining every individual separately.

Chakrapāṇi employed Śṛṅgagrahika Nyāya in different contexts of the *Charaka Saṃhitā* to justify representative description and contextual interpretation, thereby facilitating a clearer understanding of the author's intended meaning.

Interestingly, the principle underlying Śṛṅgagrahika Nyāya extends beyond textual interpretation and reflects a broader process of selective identification based on representative characteristics.

A conceptually similar approach is observed in modern Artificial Intelligence (AI), where computational models identify the most informative features from large and complex datasets to improve classification, prediction and decision-making through feature selection and pattern recognition.

Feature selection aims to identify the most relevant attributes from a dataset while eliminating redundant or irrelevant variables, thereby improving model performance, computational efficiency, and interpretability.[7]

Similarly, pattern recognition enables AI systems to distinguish meaningful patterns and classify similar entities based on their characteristic features. [8]

Attention mechanisms further enhance this process by enabling computational models to selectively focus on the most informative components of the input while assigning less importance to irrelevant information.[9]

Furthermore, Explainable Artificial Intelligence (XAI) emphasizes transparent and interpretable decision-making by identifying and communicating the features that contribute to a model's predictions. [10 11]

The selective identification of representative characteristics observed in these AI approaches bears a conceptual resemblance to the interpretative principle underlying **Śṛṅgagrahika Nyāya**, wherein a specific entity is recognized through its distinguishing feature.

The present review does not suggest that Śṛṅgagrahika Nyāya represents an ancient form of Artificial Intelligence. Rather, it explores the conceptual correspondence between this classical Ayurvedic interpretative principle and contemporary computational approaches to feature identification, selective information processing and knowledge interpretation.

By integrating the epistemological principles of Ayurveda with contemporary developments in Artificial Intelligence, this review proposes a conceptual framework that may contribute to the development of transparent, context-sensitive and explainable AI applications in Ayurveda.

2. Materials and Methods:

The present study is a narrative conceptual review based on a comprehensive analysis of classical Ayurvedic texts and contemporary Artificial Intelligence (AI) literature. Classical references, including the *Charaka Saṃhitā* with Chakrapāṇi Datta's *Āyurveda Dīpikā* commentary, were reviewed to understand the principles and interpretative significance of **Śṛṅgagrahika Nyāya**. Relevant peer-reviewed articles on Nyāyas, Ayurvedic epistemology, feature selection, pattern recognition, attention mechanisms, and Explainable Artificial Intelligence (XAI) were identified through electronic databases including PubMed, Scopus, Google Scholar, IEEE Xplore and ACM Digital Library. The retrieved literature was critically analyzed and conceptually synthesized to explore the relationship between Śṛṅgagrahika Nyāya and modern AI approaches for feature identification and knowledge interpretation

3. Classical Perspective of Śṛṅgagrahika Nyāya

3.1 Classical Concept of Śṛṅgagrahika Nyāya

Śṛṅgagrahika Nyāya is one of the important interpretative principles employed by Chakrapāṇi Datta in his *Āyurveda Dīpikā* commentary to elucidate concise and context-dependent statements presented in the *Charaka Saṃhitā*.

The term *Śṛṅga* literally denotes the horn of a cow or ox, while *Grahika* implies grasping or holding for the purpose of identification.

Accordingly, Śṛṅgagrahika Nyāya illustrates the identification of a particular cow from a herd by grasping its horn, thereby distinguishing it from other similar cows.

The central principle underlying this Nyāya is that when multiple entities possess similar attributes, the intended entity can be identified through its most distinctive or representative characteristic rather than by examining every individual separately.

Thus, the horn itself is not the focus of the maxim, instead, it serves as a representative identifying feature that enables accurate recognition of the desired object within a group of similar entities. This interpretative approach enables concise expression while preserving contextual precision and the original intention of the author, thereby facilitating a deeper understanding of the classical text.

Therefore, Śṛṅgagrahika Nyāya represents a principle of feature-based identification, where recognition occurs through prioritization of a meaningful attribute among multiple similar entities.

3.2 Interpretative Significance of Śṛṅgagrahika Nyāya

The concise and aphoristic nature of the *Charaka Saṃhitā* often necessitates contextual interpretation to derive the author's intended meaning. In such situations, Chakrapāṇi Datta employed Śṛṅgagrahika Nyāya as an interpretative aid to explain representative descriptions and avoid unnecessary elaboration. Instead of enumerating every possible entity belonging to a particular group, Chakrapāṇi frequently interpreted the mention of a representative example as indicative of all entities sharing similar defining characteristics. This principle ensures that brevity does not compromise comprehensiveness and allows the commentator to preserve the scientific intent of the original text while maintaining clarity of interpretation.

Consequently, Śṛṅgagrahika Nyāya represents not merely a literary maxim but an epistemological framework for representative reasoning, selective identification and contextual knowledge interpretation in Ayurvedic literature.

3.3 Applications of Śṛṅgagrahika Nyāya in the *Charaka Saṃhitā*

Śṛṅgagrahika Nyāya has been applied by Chakrapāṇi Datta at several places in the *Charaka Saṃhitā* to explain representative enumeration and contextual interpretation. Its applications span multiple sections of the text, including *Sūtrasthāna*, *Nidānasthāna*, *Vimānasthāna*, *Śārīrasthāna*, *Indriyasthāna*, and *Cikitsāsthāna*.

Table 1. Applications of Śṛṅgagrahika Nyāya in the Charaka Saṃhitā and Their Interpretative Significance[12]

S.N.	Reference	Chakrapāṇi's Expression	Classical Context (Summary)	Interpretative Significance
1	**Cha. Su. [13]4/19**	**Shringagrahikayokta**	In the context of **Mahākāṣāya classification,** 500 medicinal substances are grouped into 50 categories based on similarity in their therapeutic actions. Chakrapāṇi explains this representative grouping through Śṛṅgagrahika Nyāya, analogous to identifying a cow from a herd by holding its horn.	Demonstrates the principle of **representative knowledge**, where a defining characteristic enables understanding of a larger category without exhaustive enumeration. This reflects the process of abstraction and feature-based categorization, providing a conceptual basis for comparison with knowledge representation approaches.
2	**Cha. Ni. 7/15[14]**	**Shringagrahikaya Brute**	In the context of **Bhūtonmāda classification and prognosis,** among the three intentions of the causative agent—**Hiṃsā, Rati, and Abhyarcana**—special emphasis is given to the manifestations of Hiṃsā-type Bhūtonmāda. Chakrapāṇi explains that this representative description is provided due to its clinical importance, as violent symptoms may lead to self-harm and require immediate recognition.	Demonstrates **priority-based representative description,** where the most significant feature or condition is highlighted to represent an important clinical category. Śṛṅgagrahika Nyāya supports focused knowledge representation by emphasizing relevant features for recognition and decision-making.
3	**Cha. Vi. 1/13[15]**	**Shringagrahikaya Kathayishyama**	In the context of **six tastes and their effects on Doṣas,** three representative substances—**Taila, Sarpi, and Madhu** are specifically described as the best examples for alleviating **Vāta, Pitta, and Kapha,** respectively. Chakrapāṇi explains this selective description through Śṛṅgagrahika Nyāya	Demonstrates **representative selection based on excellence,** where the most significant example is chosen to represent a wider group of similar entities. Śṛṅgagrahika Nyāya reflects knowledge abstraction through identification of optimal representative features.
4	**Cha. Sha. 4/30[16]**	**Shringagrahikataya Vaktumaha**	In the context of **fetal development and congenital abnormalities, t**hree specific deformities—**Vandhyā, Putiprajā, and Vārtā**—are described as representative examples of abnormalities arising due to vitiation of maternal factors. Other possible variations are left for interpretation based on the **physician's Yukti.**	Demonstrates **representative examples for broader clinical understanding,** where selected important entities represent a wider spectrum of conditions. Śṛṅgagrahika Nyāya supports knowledge extension through recognition of characteristic patterns beyond explicitly described examples.

5	**Cha. Sha. 6/10**[17]	**Shringagrahikaya Karmaaha**	In the context of **properties of body tissues (Śarīra Dhātu Guṇa),** Caraka describes the effects of **Guru and Laghu Guṇa** as representative examples to explain the increase and decrease of tissues through similar and opposite dietary attributes. Other paired attributes are not elaborated to avoid unnecessary expansion of the text.	Demonstrates **representative principle-based explanation**, where selected attributes are used to convey the application of a broader set of principles. Śṛṅgagrahika Nyāya enables knowledge generalization from specific examples to wider concepts through underlying patterns.
6	**Cha. Ind. 4/7**[18]	**Shringagrahikaya Abhidhiyante**	In the context of **prognostic signs related to perception,** specific visual abnormalities, such as perceiving the sky as solid and the earth as void, are described as indicators of imminent death. These examples are highlighted due to the importance of vision among the sense organs.	Demonstrates **representative clinical description,** where significant examples are selected to indicate a broader category of prognostic manifestations. Śṛṅgagrahika Nyāya supports prioritization of clinically meaningful features for effective recognition and interpretation.
7	**Cha. Su. 14/67** [19]	**Shringagrahikaya Pathyam Noktam**	In the context of **post-sudation management,** Caraka advises the intake of a wholesome diet after proper fomentation, but specific dietary substances are not described. Chakrapāṇi interprets this through Śṛṅgagrahika Nyāya, indicating that suitable **Pitta-alleviating dietary measures** may be considered appropriate in this context.	Demonstrates **implicit knowledge representation,** where omitted details are understood through contextual principles rather than direct enumeration. Śṛṅgagrahika Nyāya enables comprehensive interpretation while avoiding unnecessary expansion of the text.
8	**Cha. Chi. 8/45-47** [20]	**Shringagrahikaya Anirdeshat**	In the context of **Rājayakṣmā classification** based on symptomatology, three forms—**Ekādaśarūpa, Ṣaḍrūpa, and Trirūpa** are described. While eleven and six symptoms are specifically enumerated, the individual symptoms of **Trirūpa Rājayakṣmā** are not separately mentioned. Chakrapāṇi explains that any three symptoms among the eleven may constitute Trirūpa Rājayakṣmā.	Demonstrates **implicit representation and inference,** where detailed enumeration is avoided because the concept can be understood through the broader category. Śṛṅgagrahika Nyāya enables interpretation of unmentioned combinations through underlying patterns rather than explicit listing.

9	**Cha. Chi. 28/72-74** [21]	**Shringagrahikaya Anukta**	In the context of **management of Vātavyādhi**, certain severe conditions requiring cautious treatment are described, with the condition that they should be recent, uncomplicated, and present in a strong patient. The specific list of possible complications is not enumerated in this context, as it is elaborated separately later.	Demonstrates **knowledge compression through omission,** where exhaustive listing is avoided and the physician is guided to infer relevant details through clinical reasoning. Śṛṅgagrahika Nyāya supports contextual understanding while preventing unnecessary expansion and repetition of knowledge.
10	**Cha. Chi. 30/313-314** [22] **Cha. Vi. 8/94**[23]	**Shringagrahikaya Noktam**	In the context of **drug dosage determination,** Caraka explains that medicine should neither be administered in insufficient nor excessive quantity. The exact dose is not universally specified because it depends on factors such as disease severity, Doṣa involvement, and individual strength.	Demonstrates **context-dependent knowledge interpretation,** where a fixed description is avoided and the physician is guided to apply reasoning according to individual variables. Śṛṅgagrahika Nyāya facilitates adaptive decision-making by conveying a general principle applicable to diverse clinical situations.
11	**Cha. Chi. 30/315-319** [24] **Cha. Su. 6/50**[25]	**Shringagrahikaya Udaharanam Na Kritam**	In the context of **Satmya (adaptation and wholesomeness),** Caraka describes the role of habitual intake and geographical factors in determining suitability of food and regimen. The specific concept of Puruṣa Satmya is not elaborated with examples in this context, which Chakrapāṇi explains through Śṛṅgagrahika Nyāya.	Demonstrates **individualized knowledge representation,** where detailed examples are avoided because suitability varies according to individual characteristics. Śṛṅgagrahika Nyāya enables interpretation of broader principles through contextual factors, reflecting adaptive and personalized understanding.
12	**Cha. Su. 27/329-330**[26]	**Shringagrahikaya Kathanam, Shringagrahikaya Akathanam**	In the context of **Anna and Pāna Dravyas,** only commonly used dietary substances and beverages are described, while exhaustive enumeration of all possible substances is avoided. The properties of unmentioned substances are understood through their inherent characteristics, such as Mahābhūta predominance and regional factors.	Demonstrates **selective representation and contextual inference,** where representative examples convey knowledge of a broader category. Śṛṅgagrahika Nyāya facilitates systematic knowledge organization by balancing comprehensive understanding with avoidance of unnecessary expansion.

Cha. Su.: Charaka Sutra Sthana, Cha. Ni.: Charaka Nidana Sthana, Cha. Vi.: Charaka Vimana Sthana, Cha. Sha.: Charaka Sharira Sthana, Cha. Ind.: Charaka Indriya Sthana, Cha. Chi.: Charaka Chikitsa Sthana.

3.4 Epistemological Dimensions of Śṛṅgagrahika Nyāya: Insights from Classical Applications

The diverse applications of Śṛṅgagrahika Nyāya described by Chakrapāṇi in the Charaka Saṃhitā indicate that this principle extends beyond a literary analogy and represents a systematic approach for knowledge interpretation. Analysis of the classical contexts demonstrates that Śṛṅgagrahika Nyāya facilitates identification of meaningful information from extensive knowledge structures through selective representation, contextual understanding and logical inference.

The applications of Śṛṅgagrahika Nyāya reveal four fundamental epistemological dimensions:

1. Representative Knowledge Representation

In the context of Mahākāṣāyas, numerous medicinal substances were classified into broader groups based on similarity in therapeutic action. Instead of describing every substance individually, representative categories were used to convey the essential characteristics of a larger group. This demonstrates the principle of representing extensive knowledge through significant identifying features.

2. Knowledge Compression and Contextual Inference

Several contexts, including Annapānavidhi, Swedādhyāya, and Vātavyādhi, demonstrate that omission of detailed information does not indicate absence of knowledge. Rather, certain details were intentionally not elaborated because they could be understood through contextual principles and logical reasoning. This approach maintained conciseness while preserving the comprehensiveness of the treatise.

3. Feature-Based Identification and Prioritization

The descriptions related to Bhūtonmāda, prognostic features, and Rājayakṣmā demonstrate selective emphasis on clinically important characteristics. Specific manifestations were highlighted because of their greater diagnostic or prognostic relevance. Thus, recognition was achieved through identification of the most informative features among multiple possibilities.

4. Adaptive and Individualized Interpretation

The contexts related to Satmya and dosage determination illustrate that the application of knowledge depends upon individual characteristics, disease conditions, and contextual variables. Śṛṅgagrahika Nyāya therefore supports a flexible interpretative approach rather than a rigid application of generalized information.

Collectively, these dimensions demonstrate that Śṛṅgagrahika Nyāya functions as a classical framework of **selective information processing, representative classification, and context-dependent knowledge interpretation**. These characteristics provide the conceptual foundation for exploring its parallels with contemporary Artificial Intelligence approaches, where relevant feature identification, pattern recognition, and explainable decision-making are essential components of intelligent systems.

4. Conceptual Parallel Between Śṛṅgagrahika Nyāya and Artificial Intelligence

Artificial Intelligence (AI) refers to computational systems capable of performing tasks that traditionally require human cognitive abilities, including learning, reasoning, pattern recognition and decision-making. Modern AI systems analyse large volumes of structured and unstructured data to identify meaningful relationships, extract informative features and generate predictions or interpretations based on computational models and statistical learning algorithms.[27]

A fundamental principle underlying intelligent information processing is that not every available data element contributes equally to decision-making. Contemporary AI methodologies therefore emphasize selective identification of informative features, reduction of redundant information and recognition of meaningful patterns within complex datasets. These approaches exhibit a conceptual resemblance to the interpretative principle underlying Śṛṅgagrahika Nyāya, wherein identification of an intended entity is achieved through recognition of a distinguishing characteristic among multiple similar entities.

The preceding analysis of the twelve classical applications of Śṛṅgagrahika Nyāya demonstrates that Chakrapāṇi consistently employed this maxim to facilitate representative knowledge organization, contextual inference, feature prioritization and adaptive interpretation. Although these applications were developed for interpretation of Ayurvedic literature rather than computational analysis, they collectively reveal an underlying epistemological framework based on selective information processing. This shared principle forms the conceptual basis for comparison with modern AI methodologies.

It is important to emphasize that the present comparison does not imply that Śṛṅgagrahika Nyāya represents an ancient form of Artificial Intelligence. Śṛṅgagrahika Nyāya is an epistemological and interpretative principle rooted in Ayurvedic knowledge systems, whereas Artificial Intelligence is a computational discipline founded upon mathematical modelling, algorithms, and statistical learning. The similarity discussed in this review is therefore conceptual rather than historical or technological.

To illustrate these conceptual relationships more clearly, the major epistemological dimensions of Śṛṅgagrahika Nyāya may be compared with corresponding AI methodologies (Table 2).

Table 2. Conceptual Correspondence Between Epistemological Dimensions of Śṛṅgagrahika Nyāya and Modern Artificial Intelligence

Epistemological dimension of Śṛṅgagrahika Nyāya	Conceptual significance in Ayurveda	Comparable AI methodology	Shared conceptual principle
Representative knowledge representation	Representative examples describe larger conceptual groups without exhaustive enumeration	Feature representation; Knowledge representation	Important features represent complex information efficiently

Feature-based identification and prioritization	Recognition through distinguishing characteristics	Feature selection; Feature extraction	Identification based on informative characteristics rather than all available variables
Knowledge compression and contextual inference	Omitted information is inferred using context and logical reasoning	Natural language processing; Context-aware learning	Context enables interpretation beyond explicitly stated information
Pattern-based reasoning	Similar entities differentiated through characteristic patterns	Pattern recognition; Machine learning classification	Recognition through meaningful relationships among features
Adaptive and individualized interpretation	Clinical application varies according to patient, disease, and context	Personalized AI; Clinical decision-support systems	Decision-making incorporates multiple context-dependent variables
Logical explanation of interpretation	Identification supported by commentary and reasoning	Explainable Artificial Intelligence (XAI)	Transparent interpretation enhances reliability and understanding

4.1 Śṛṅgagrahika Nyāya and Feature Selection

Feature selection is a fundamental process in machine learning whereby the most informative variables are selected from a larger set of available features while redundant or irrelevant variables are excluded. Appropriate feature selection improves predictive accuracy, reduces computational complexity, minimizes overfitting, and enhances model interpretability.[28]

Within AI-based classification systems, meaningful features function as identifying markers that distinguish one class from another. For example, clinical prediction models may identify a limited number of laboratory parameters, imaging characteristics, or demographic variables that contribute most significantly to disease prediction, while numerous other variables contribute little to the final decision.

A similar conceptual principle is reflected in Śṛṅgagrahika Nyāya. The horn does not possess intrinsic importance independent of the animal; rather, it serves as the representative characteristic that enables identification of the intended cow among many visually similar animals. Likewise, feature selection algorithms identify the variables that possess the greatest discriminatory value for recognizing a specific outcome.

Thus, both approaches emphasize that meaningful recognition depends not upon exhaustive examination of every available attribute but upon identification of those features that carry the highest informational significance.

Table 3: Conceptual analogy between Śṛṅgagrahika Nyāya and feature selection in Artificial Intelligence

Śṛṅgagrahika Nyāya	**Artificial Intelligence**
Herd containing similar entities	Large dataset containing multiple information units
Horn as the identifying characteristic	Informative feature or parameter
Identification of a specific cow	Classification or prediction
Selection of a distinguishing characteristic	Feature selection / Feature extraction
Interpretation based on the identifying feature	Decision-making based on relevant information

The above comparison illustrates that both approaches rely on identification of the most informative characteristic for accurate recognition, although one represents a classical interpretative principle while the other represents a computational methodology.

Thus, Śṛṅgagrahika Nyāya may be understood as a classical epistemological model of feature-based identification that conceptually resembles the selective information-processing strategies employed in modern Artificial Intelligence.

4.2 Śṛṅgagrahika Nyāya and Pattern Recognition

Pattern recognition constitutes one of the fundamental capabilities of Artificial Intelligence. Machine learning algorithms identify regularities, similarities, and meaningful relationships within datasets and subsequently apply these learned patterns for classification, prediction, or decision-making.

Healthcare AI extensively utilizes pattern recognition for disease diagnosis, risk prediction, medical imaging interpretation, and clinical decision support, where multiple variables are analysed collectively rather than individually.

The reasoning process reflected in Śṛṅgagrahika Nyāya similarly depends upon recognition of meaningful patterns. The intended entity is distinguished from numerous similar entities through its defining

characteristic, allowing accurate identification without complete enumeration of every possibility.

Accordingly, both Śṛṅgagrahika Nyāya and modern pattern recognition rely upon selective interpretation of meaningful relationships rather than isolated observations.

4.3 Śṛṅgagrahika Nyāya and Attention Mechanisms

Recent advances in deep learning have introduced **attention mechanisms**, which enable neural networks to selectively focus on the most relevant components of input data during information processing. Originally proposed for neural machine translation, attention mechanisms have subsequently become the foundational principle of transformer-based architectures that now dominate natural language processing and numerous other AI applications.[29]

Within transformer models, attention weights dynamically determine the relative importance of different input elements according to contextual relevance, thereby allowing the model to prioritize informative features while reducing the influence of less relevant information.

This computational strategy demonstrates an interesting conceptual resemblance to Śṛṅgagrahika Nyāya. In both approaches, recognition is achieved through selective emphasis on the most informative component within a larger collection of information. Nevertheless, an important distinction remains. Attention mechanisms derive their importance scores through mathematical optimization during model training, whereas Śṛṅgagrahika Nyāya represents an interpretative principle grounded in logical reasoning, contextual understanding, and scholarly analysis.

Thus, the similarity exists in the shared concept of selective attention rather than in the underlying mechanism through which selection occurs.

4.4 Śṛṅgagrahika Nyāya and Explainable Artificial Intelligence

Increasing clinical application of Artificial Intelligence has highlighted the importance of transparency and interpretability in healthcare decision-making. Although deep learning models often achieve high predictive accuracy, their internal reasoning frequently remains difficult to interpret, giving rise to the widely recognized "black-box" problem.

Explainable Artificial Intelligence (XAI) seeks to overcome this limitation by identifying and communicating the factors responsible for AI-generated predictions, thereby improving clinician trust, validation, accountability, and safe implementation in healthcare.[30]

A conceptual similarity may be observed between this objective and the interpretative methodology employed by Chakrapāṇi Datta. Rather than merely identifying representative concepts, Chakrapāṇi consistently explained *why* a particular example was selected and *how* it should be interpreted within its textual context. Consequently, Śṛṅgagrahika Nyāya demonstrates that identification acquires scientific value only when accompanied by logical explanation and contextual justification.

Accordingly, although developed in entirely different intellectual traditions, both XAI and Śṛṅgagrahika Nyāya emphasize that meaningful interpretation should be transparent, explainable, and supported by identifiable reasoning rather than remaining implicit or obscure.

4.5 Conceptual Synthesis

Collectively, the preceding comparisons indicate that the conceptual relationship between Śṛṅgagrahika Nyāya and Artificial Intelligence is founded upon the shared principle of **selective information processing**. Representative knowledge organization, feature selection, pattern recognition, contextual prioritization, and explainable interpretation constitute recurring themes in both domains, despite their fundamentally different epistemological foundations.

Rather than suggesting technological equivalence, these parallels demonstrate how a classical Ayurvedic interpretative maxim can provide a valuable conceptual framework for understanding modern approaches to intelligent information processing. Such interdisciplinary dialogue may contribute to the future development of transparent, context-sensitive, and explainable AI systems for Ayurvedic knowledge organization and clinical decision support while preserving the epistemological integrity of classical Ayurveda.

5. Applications of Śṛṅgagrahika Nyāya in Ayurveda-Oriented Artificial Intelligence Systems

The integration of Artificial Intelligence (AI) into Ayurveda requires computational approaches capable of handling the complexity, contextual dependence, and interconnected nature of classical Ayurvedic knowledge. Unlike conventional biomedical datasets, where variables are often represented as independent entities, Ayurvedic knowledge is organized through intricate relationships among **Doṣa, Dhātu, Mala, Agni, Prakṛti, Srotas, disease manifestations, and therapeutic principles**. Consequently, Ayurveda-oriented AI systems require not only efficient data processing but also meaningful knowledge representation, contextual interpretation, transparent reasoning, and individualized decision support.

The epistemological principles underlying **Śṛṅgagrahika Nyāya**, namely representative identification, selective information processing, contextual inference, and explainable interpretation, provide a conceptual framework for designing interpretable AI applications in Ayurveda. Rather than suggesting that Śṛṅgagrahika Nyāya represents an ancient form of Artificial Intelligence, these conceptual similarities may inspire computational models capable of preserving the contextual and reasoning-oriented philosophy of Ayurveda while utilizing modern AI methodologies.

Table 4. Potential Applications of Śṛṅgagrahika Nyāya in Ayurveda-Oriented Artificial Intelligence

Artificial Intelligence Domain	Conceptual Principle of Śṛṅgagrahika Nyāya	Potential Ayurveda Application
Natural Language Processing (NLP)	Identification of representative concepts and contextual meaning	Context-aware interpretation of classical Ayurvedic texts
Knowledge Representation	Organization of knowledge through representative entities and relationships	Ayurveda knowledge graphs and ontologies
Clinical Decision Support Systems	Prioritization of clinically significant features	Doṣa-based diagnosis and personalized treatment planning
Pharmacological Intelligence	Feature-based grouping of medicinal substances	Computational organization of Dravyaguṇa and Mahākāṣāya knowledge
Explainable Artificial Intelligence	Transparent reasoning based on representative features	Explainable and physician-interpretable AI systems

5.1 Artificial Intelligence-Assisted Interpretation of Ayurvedic Classical Texts

Ayurvedic classical literature preserves scientific knowledge in concise **Sūtras**, whose interpretation depends upon linguistic context, semantic relationships, and authoritative commentaries. Conventional keyword-based retrieval systems often identify isolated terms but fail to capture the contextual meaning intended by the classical authors.

Recent advances in **Natural Language Processing (NLP)** have substantially improved contextual text understanding through transformer-based language models such as **BERT** and **BioBERT**, which learn semantic representations from large textual corpora instead of relying solely on lexical matching. These models have demonstrated remarkable performance in biomedical information extraction, document classification, question answering, and semantic search.[31] [32]

From a conceptual perspective, **Śṛṅgagrahika Nyāya** reflects a comparable interpretative strategy. Rather than considering every word independently, it emphasizes identification of representative concepts that convey broader meaning within a given context. Similarly, AI-assisted interpretation of Ayurvedic literature may prioritize clinically and philosophically significant concepts, their semantic relationships, and contextual associations instead of merely identifying frequently occurring words.

Such an approach may facilitate automated interpretation of classical Ayurvedic texts, semantic indexing of Saṃhitās, intelligent literature retrieval, concept mapping, and development of context-aware digital knowledge repositories while preserving the interpretative depth of traditional commentaries.

5.2 Development of Ayurveda Knowledge Representation Systems

Knowledge representation is a fundamental component of Artificial Intelligence that enables computational systems to organize information into structured entities and their relationships, thereby supporting semantic reasoning, inference generation, and intelligent information retrieval. Contemporary AI commonly employs **knowledge graphs** and **ontologies** to represent complex domains in a machine-interpretable form.[33]

Ayurveda inherently constitutes a multidimensional knowledge system in which diseases, Doṣas, Dhātus, Guṇas, Rasa, medicinal substances, therapeutic actions, pathological mechanisms, and treatment principles are interconnected through numerous semantic relationships. Representing such complexity requires computational models capable of preserving these conceptual associations without unnecessary redundancy.

The representative reasoning embodied in **Śṛṅgagrahika Nyāya** provides a conceptual analogy for this process. Instead of independently describing every individual entity, representative characteristics are utilized to communicate broader categories and their relationships. Similarly, Ayurveda-oriented knowledge graphs may prioritize essential entities and their meaningful associations while maintaining the hierarchical organization of classical knowledge.

Such structured knowledge representation could support semantic search, automated literature mining, intelligent educational systems, ontology-based reasoning, and integration of classical Ayurvedic concepts with contemporary biomedical knowledge, thereby facilitating the development of advanced AI applications for Ayurveda.

5.3 Ayurveda-Based Clinical Decision Support Systems

Artificial Intelligence-based Clinical Decision Support Systems (CDSS) are increasingly being utilized to assist clinicians in diagnosis, prognosis, and therapeutic planning by analysing complex clinical information. Unlike conventional biomedical decision-making, Ayurvedic diagnosis involves simultaneous evaluation of multiple patient-specific variables, including **Prakṛti, Vikṛti, Doṣa predominance, Agni, Bala, Deśa, Kāla, Nidāna, Lakṣaṇa,** and disease stage.[34]

However, not all clinical variables contribute equally to diagnosis in every patient. Similar to the principle of **Śṛṅgagrahika Nyāya**, where a representative feature enables identification among similar entities, AI-based decision support systems may prioritize the most clinically informative patient characteristics while minimizing less relevant information. Such an approach could improve diagnostic transparency and support individualized Ayurvedic assessment without replacing physician judgement. Clinical reasoning (Yukti) and physician expertise should remain the final determinants of diagnosis and treatment decisions.

5.4 Artificial Intelligence-Based Ayurvedic Pharmacological Knowledge Analysis

Ayurvedic pharmacology describes medicinal substances through multidimensional attributes including **Rasa, Guṇa, Vīrya, Vipāka, Prabhāva**, and therapeutic actions. Because many medicinal plants share overlapping pharmacodynamic properties, systematic organization of Ayurvedic pharmacological knowledge remains challenging.

Artificial Intelligence is increasingly employed in drug discovery and biomedical research to identify therapeutic relationships, predict drug-target interactions, and organize complex pharmacological datasets.[35]

The Mahākāṣāya classification described in the *Charaka Saṃhitā* represents a classical example of grouping hundreds of medicinal substances according to their predominant therapeutic actions. This method conceptually resembles AI-based feature clustering and knowledge classification, where representative characteristics are used to organize extensive information. Inspired by **Śṛṅgagrahika Nyāya**, future AI systems may facilitate computational organization of Ayurvedic pharmacological knowledge by identifying the most informative therapeutic features while preserving classical principles.

5.5 Towards Explainable and Context-Sensitive Ayurveda AI

With the increasing adoption of Artificial Intelligence in healthcare, transparency and interpretability have become essential requirements. Explainable Artificial Intelligence (XAI) seeks to make AI-generated decisions understandable by identifying the factors responsible for individual predictions, thereby improving clinical trust and reliability.[36]

Ayurvedic knowledge has always emphasized contextual interpretation rather than rigid rule-based application. Classical commentators such as Chakrapāṇi Datta explained concise Sūtras through logical reasoning, representative examples, and contextual analysis. The application of **Śṛṅgagrahika Nyāya** illustrates that meaningful identification should always be accompanied by rational explanation.

Therefore, Śṛṅgagrahika Nyāya provides an important conceptual model for the development of **transparent, interpretable, and context-sensitive Ayurveda-oriented AI systems**. Instead of functioning merely as predictive tools, such systems should explain **why** specific clinical features, textual concepts, or therapeutic relationships have been prioritized. This conceptual framework aligns closely with the objectives of Explainable Artificial Intelligence and may facilitate trustworthy integration of AI into Ayurvedic education, research, and clinical practice.

6. Discussion

The present review explored the conceptual relationship between **Śṛṅgagrahika Nyāya** and selected principles of contemporary Artificial Intelligence (AI), including feature selection, pattern recognition, attention mechanisms, and Explainable Artificial Intelligence (XAI). The analysis demonstrates that Śṛṅgagrahika Nyāya extends beyond a literary maxim and functions as an epistemological framework for representative reasoning, selective feature identification, and contextual knowledge interpretation. Rather than establishing a historical or technological equivalence between Ayurveda and AI, the review identifies a conceptual correspondence based on the shared principle of recognizing meaningful information from complex knowledge structures.

The applications of Śṛṅgagrahika Nyāya described by Chakrapāṇi Datta illustrate that representative examples, contextual inference, and prioritization of significant characteristics enable concise yet comprehensive interpretation of classical knowledge. Conceptually, these principles resemble modern AI approaches that improve decision-making by identifying informative features, recognizing meaningful patterns, and providing interpretable explanations. Although the methodologies differ fundamentally, both systems emphasize that accurate interpretation depends on the identification of relevant information rather than exhaustive analysis of every available element.

The findings of this review have important implications for the future integration of Artificial Intelligence in Ayurveda. A Śṛṅgagrahika-inspired conceptual framework may support the development of Natural Language Processing (NLP) models for classical text interpretation, ontology- and knowledge graph-based representation of Ayurvedic concepts, explainable clinical decision support systems, and computational organization of Ayurvedic pharmacological knowledge. By emphasizing representative reasoning and contextual interpretation, this framework may contribute to the development of transparent, context-sensitive, and explainable AI applications while preserving the individualized principles of Ayurvedic practice.

However, the present review has certain limitations. It is a conceptual narrative review based on comparative analysis of classical Ayurvedic literature and contemporary AI concepts, without computational implementation or experimental validation. Therefore, the proposed relationship should be interpreted as an epistemological analogy rather than evidence that Śṛṅgagrahika Nyāya represents an early form of Artificial Intelligence. Future interdisciplinary research should focus on developing and validating AI models

inspired by these conceptual principles using authentic Ayurvedic datasets and clinical applications.

Table 5. Key Implications of the Present Review

Aspect	Key Observation
Principal finding	Śṛṅgagrahika Nyāya represents a classical framework for representative feature identification and contextual interpretation.
Conceptual significance	Demonstrates conceptual correspondence with feature selection, pattern recognition, attention mechanisms, and Explainable AI without implying historical equivalence.
Potential applications	AI-assisted interpretation of classical texts, Ayurveda knowledge graphs, clinical decision support systems, pharmacological knowledge analysis, and Explainable AI.
Limitation	Conceptual review without computational implementation or experimental validation.
Future direction	Development and validation of Ayurveda-oriented AI frameworks based on classical epistemological principles.

7. Conclusion

Śṛṅgagrahika Nyāya represents an important Ayurvedic interpretative principle that enables representative reasoning, selective feature identification, and contextual knowledge interpretation. The present review demonstrates a conceptual correspondence between this classical epistemological framework and contemporary Artificial Intelligence approaches, including feature selection, pattern recognition, attention mechanisms, and Explainable Artificial Intelligence (XAI). Although these similarities do not imply historical or technological equivalence, they highlight a shared emphasis on identifying meaningful information for accurate interpretation and decision-making.

The proposed conceptual framework provides a novel interdisciplinary perspective that may support the development of transparent, context-sensitive, and explainable AI applications in Ayurveda, particularly in areas such as classical text interpretation, knowledge representation, and clinical decision support. Future interdisciplinary research should focus on translating these conceptual insights into computational models and validating their applicability in Ayurveda-oriented AI systems.

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