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Linguistic Challenges in Representing Botanical Terms in English and Uzbek Electronic Dictionaries

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ABSTRACT

The depiction of botanical terminology in computer dictionaries poses considerable linguistic issues, especially when comparing English and Uzbek. Differences in scientific and common names, polysemy, translation difficulties, and the absence of standardised botanical terminology in Uzbek all contribute to these challenges. While English has a well-developed botanical lexicon with clear boundaries between scientific and vernacular names, Uzbek frequently relies on folk names, which vary by location and lack direct scientific counterparts. Furthermore, phonetic and morphological adaptations of Latin name in Uzbek result in contradictions in representation. The problem is exacerbated by the lack of comprehensive taxonomic databases and limited search capabilities in Uzbek electronic dictionaries. This study focusses on the major linguistic challenges in describing botanical terms in both languages and investigates potential solutions such as standardised terminology creation, enhanced dictionary search algorithms, and integration with worldwide botanical databases. Addressing these difficulties will improve the accuracy and accessibility of botanical information in electronic dictionaries, thereby helping both the linguistic and scientific communities.

Keywords: Botanical terminology, linguistic challenges, scientific names, common names, phonetic differences, polysemy, electronic dictionaries.

1. INTRODUCTION

Botanical nomenclature is essential for scientific communication, education, and cultural understanding, yet proper representation in electronic dictionaries remains a substantial linguistic difficulty. English, as the world's primary scientific language, has a well-organised botanical lexicon that contains scientific names based on Latin nomenclature as well as generally accepted common names. In contrast, Uzbek relies significantly on vernacular plant names, many of which vary by location and lack precise scientific equivalents. This discrepancy complicates the translation, standardisation, and organisation of botanical terminology in electronic dictionaries. One of the biggest challenges is the separation between scientific and popular names, which English makes obvious, but Uzbek frequently combines traditional and folk nomenclature. Furthermore, polysemy and homonymy introduce ambiguity because some botanical terminology have several meanings in different situations. Phonetic and morphological changes affect the depiction of Latin-derived plant names in Uzbek, resulting in inconsistencies across digital platforms. Furthermore, the absence of integration with taxonomic databases in Uzbek electronic dictionaries leads in outdated or incomplete categories, restricting their utility to academics, students, and the general public.

This research investigates the linguistic difficulties in describing botanical terminology in English and Uzbek electronic dictionaries, focussing on translation, lexical gaps, and technical restrictions. It also considers potential remedies, such as standardising botanical nomenclature in Uzbek, upgrading digital dictionary search algorithms, and integrating worldwide taxonomic databases for greater accuracy and accessibility.

2. METHODS AND METHODOLOGY

We tried to use a qualitative and comparative linguistic methods to examine the structural, semantic, and technical challenges connected with botanical terminology in both languages. The methodology combines descriptive, comparative research, with

data from language resources, electronic dictionaries, and taxonomy databases [1]. We gathered botanical terms to analyze from the paper – based and electronic dictionaries such as *Oxford English Dictionary* (OED), *Cambridge Dictionary, Uzbek National Corpus*, and Uzbek-Russian-English botanical dictionaries [2], academic and linguistic studies on English and Uzbek linguistic resources [3].

Firstly, the intricacy, diversity, and history of botanical nomenclature create linguistic issues for describing botanical terminology in electronic dictionaries. These issues can be divided into the following key areas:

2.1. *Terminological complexity*

Botanical terminology is extremely specialised and requires accurate representation. Key concerns include:

1. **Scientific naming system (Binomial nomenclature)**: Plant names use the binomial nomenclature system, which consists of a genus and a species name (for example, Rosa indica).The International Code of Nomenclature for Algae, Fungi, and Plants (ICN) governs the scientific naming system, and plant names are often updated in response to new findings. Plant names frequently contain author abbreviations (e.g., L. for Linnaeus in Rosa indica L.), which must be accurately reproduced in electronic dictionaries.
2. **Taxonomic revisions and synonyms**: Genetic research frequently lead to reclassifications of plant species, resulting in changes to their scientific nomenclature. Many plants have multiple synonyms due to past classifications (for example, Taraxacumofficinale is also known as Leontodontaraxacum in ancient literature).Electronic dictionaries must keep track of both current and old names to avoid confusion.
3. **Morphological descriptions**: Botanical terminology refer to exact morphological descriptions of plants (such as leaf shape, flower structure, and reproductive organs). Many of these terminology are technical and foreign to most people, making it difficult to provide concise descriptions in electronic dictionaries.

2.2. *Polysemy against homonymy*
Many botanical terminology have different meanings depending on the context in which they are used.

1. **Polysemy (Multiple meanings for the same word)**: Some botanical terminology have various meanings across fields. For example:

    - the term "bark" can apply to both the outer coating of a tree and the sound emitted by a dog.
    - the term "stem" can refer to either the main plant axis or a grammatical unit in linguistics.

2. **Homonymy (same spelling but different meaning)**: Some plant names are the same as frequent words in general vocabulary. For example,

    - the term “willow” can apply to both a tree (Salix spp.) and a cricket bat.
    - the term “rose” refers to both a flower and the past tense of the verb "rise."

Electronic dictionaries should distinguish between these meanings using disambiguation techniques.

2.3. *Regional variations and vernacular names*
Plant common names vary greatly between locations and civilisations, making it difficult to adequately reflect them:

1. **Several common names for the same plant**: Depending on the locality, a single plant species can be known by dozens of different names. For instance, Carica papaya is called papaya in English, *pawpaw* in various African countries, and *mamão* in Brazil. Zingiberofficinale (ginger) goes by numerous names in different languages: *Adrak* is a Hindi word, Chinese: 姜 (*Jiāng*), Spanish: *Jengibre*.

2. **Different plants with the same common name**: The same common name might refer to various species in different places. In North America, “Cedar” commonly refers to Thuja species, while in Europe, it refers to Cedrus species. The term “bluebell” can refer to either Hyacinthoidesnonscripta (European bluebell) or Mertensiavirginica (Virginia bluebell).
3. **Translation challenges**: Certain botanical terminology do not have direct translations in other languages. Certain plants are endemic to specific areas and may not have names in other languages. Electronic dictionaries must include cross-references between scientific and vernacular names to aid multilingual comprehension.

2.4. *Latin and scientific naming issues*

Scientific plant names are primarily written in Latin, which presents unique linguistic issues.

1. **Latin grammar and word formation**: Botanical Latin adheres to grammatical principles, including gender agreements and declensions. Genus names are always capitalised (e.g., Rosa), whereas species names are lowercase (e.g., Indica). Latin suffixes indicate associations (for example, -aceae for plant families, -ales for orders). Many electronic dictionaries struggle to handle accurate Latin inflections.
2. **Hybrid and cultivar naming issues**: Hybrid plants are denoted with "×" (e.g., Platanus × acerifolia for the London plane tree).Cultivar names are written in single quotation marks (e.g., Rosa 'Peace'), however many electronic dictionaries do not format them properly.

3. RESULTS AND DISCUSSION

The study revealed numerous significant language issues in the depiction of botanical terminology in English and Uzbek electronic dictionaries. The findings reveal considerable differences in terminology, translation accuracy, and structural organisation between the two languages.

One of the most serious issues is the mismatch between scientific names, common names, and folk nomenclature in Uzbek. While English dictionaries distinguish clearly between scientific names (Latin) and colloquial names, Uzbek dictionaries frequently lack this systematic difference. Many plant names in Uzbek are based on old folk classifications, which are locally changeable and often incorrect. For example: Quercusrobur (English oak)

- **English dictionary**: "English Oak" (common name) + Quercusrobur (scientific name) [4];
- **Uzbek dictionary**: *Dub daraxti* or "oddiyeman" (common name), but scientific name is occasionally missing or incorrectly supplied.

The analysis of botanical terminology found a lack of direct lexical counterparts between English and Uzbek, resulting in semantic incompatibilities and translation difficulties [6]. Many plant names in English have no direct counterpart in Uzbek, therefore lexicographers have to borrow latin names, for example, *Taxusbaccata* [7], or use descriptive translations such as "weeping willow" → "Yig'layotgantol" or "majnuntol", which may sound strange. What's more, they have to generalise names such as "Juniperuscommunis" → "archa" which can refer to several species.

Besides that, according to Turland and his group, we discovered that Latin-based scientific names cause phonetic and morphological issues in Uzbek. Unlike English, which frequently retains Latin pronunciation, Uzbek modifications are phonetic and Turkic-based [8]. For example:

Pinussylvestris (Scots Pine) is pronounced [pˈɪnəssˈɪlvɪstɪˌɪs] in English and "Pinussilvestris" in Uzbek using phonetic criteria.

Furthermore, Uzbek suffixation patterns might modify the root structure of Latin names, resulting in anomalies in botanical nomenclature throughout Uzbek dictionaries. For instance:

Geranium – geran, yorongul
Tulipaferganica – Farg'onalolasi

Physochlainaalaica – Oloyxiyoli
Anemoebaissunensis - Boysunpo'fanagi

In addition, a review of Uzbek electronic dictionaries indicated technical issues with indexing and searching for botanical terminology. Compared to English electronic dictionaries:

- Uzbek databases sometimes lack adequate classification of botanical names (scientific vs. common names):
- it does not integrate with taxonomic databases (e.g., IPNI, Tropicos, The Plant List).
- had restricted search capabilities, making it difficult to identify synonyms or alternative spellings [9].

Moreover, inconsistencies in botanical term representation in Uzbek electronic dictionaries have important academic, scientific, and cultural repercussions. The absence of conventional botanical terminology in Uzbek presents hurdles for:

- **For students and researchers**: The lack of standardized botanical terminology in Uzbek hinders effective plant classification, impacting both students and researchers [10].
- **For translators and lexicographers**: The absence of consistent botanical terminology creates significant difficulties for translators and lexicographers working with Uzbek botanical texts [11].
- **For traditional medicine practitioners**: Regional variations in Uzbek plant names pose risks for traditional medicine practitioners, potentially leading to misidentification and errors in treatment [12].

Another issue is that the need for standardisation and database integration and to increase the correctness of botanical terminology in Uzbek electronic dictionaries, we have to

- standardise Uzbek botanical terminology using internationally recognised sources [8];

- integrate Uzbek dictionaries with worldwide taxonomic databases (such as IPNI and The Plant List) to assure scientific consistency;
- improve search engines to allow users to search using scientific names, common names, and phonetic versions [6].

Improving Translation Strategies of botanical terminology into Uzbek includes, there are some more effective methods such as:

- combining scientific Latin names with Uzbek counterparts.
- offering different translations depending on regional dialects.
- phonetic instructions are included to ensure appropriate pronunciation.
- creating a complete Uzbek botanical lexicon with standardised terminology.
- creating user-friendly digital tools with multilingual search capabilities.
- investigating AI-powered technologies for automated botanical phrase translation.

4. CONCLUSION

The study identifies substantial linguistic and technical obstacles in portraying botanical terminology in Uzbek electronic dictionaries. To address these challenges, standardisation, improved translation procedures, and tighter interaction with taxonomic databases are all necessary. By improving the representation of botanical terminology, Uzbek dictionaries can become more trustworthy resources for scientists, educators, and the general public.

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