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**Traditional Botanical Knowledge in a Contemporary Popular Science Magazine: A Case
Study of *Sinjilex Uxagan* (1980–2020)**

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Abstract

Background Traditional botanical knowledge (TBK) is vital for biodiversity conservation. However, the folk knowledge documented in contemporary minority-language popular science periodicals remains largely understudied. *Sinjilex Uxagan* (SLX), the first comprehensive natural science magazine published in Mongolian script in Inner Mongolia, China, featured both modern scientific knowledge and Mongolian traditional knowledge. This study catalogs and validates the TBK published in SLX across its 40-year existence to expand the philological research scope of ethnobotany and offer empirical evidence for the integrated conservation and intergenerational transmission of regional biocultural diversity.

Methods Plant records were extracted from SLX using documentary research and contextualized through semistructured interviews. Plant species were validated using field

survey data collected by our research team since 1984 and taxonomic reference works. All accepted scientific plant names were standardized and validated according to the World Flora Online (WFO). A five-category coding system was applied to quantify the consistency, complementarity, and originality of the TBK documented in the magazine relative to prior research findings.

Results Among the 6,271 articles included in 234 issues of SLX (1980–2020), a total of 41 core articles recording TBK were screened, 85.4% of which were original grassroots contributions. Taxonomic verification confirmed 124 taxa (120 species, three varieties, and one subspecies) with traditional utilization values, belonging to 95 genera and 48 families. Plant utilization parts were classified into eight categories, with 34.7% of the species exhibiting intensive multipart utilization. Recorded plant functions were divided into six categories, dominated by medicinal (69 species), edible (46 species), and forage (38 species). Comparative analysis indicated that 80.6% of records were highly consistent with prior literature, while identifying 24 novel and 14 extended utilitarian records.

Conclusions The TBK recorded in SLX reflects the survival wisdom of Mongolian nomadic communities in the multifunctional utilization of plant resources. Ethnic minority popular science magazines featuring original contributions from TBK holders provide a unique bridge for documenting and preserving TBK while empowering community voices. Further research should focus on field validation and experimental verification of extended plant use records, as well as facilitating the dynamic intergenerational transmission of TBK to support the conservation of biocultural diversity.

Keywords: *Sinjilex Uxagan*; Mongolian ethnic group; popular science magazine; traditional botanical knowledge; ethnobotany.

Background

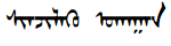
Traditional knowledge plays an essential role in biodiversity conservation and the sustainable utilization of biological resources [1] and can serve as an essential knowledge base for strategic environmental management across diverse ecosystems [2]. Over the past four decades of ethnobotanical development in China, a substantial corpus of traditional botanical knowledge (TBK) has been documented, generating a rich inventory of empirical plant utilization cases [3, 4]. However, China's rich and diverse TBK and culture continue to face significant challenges. Attention and research devoted to their conservation and sustainable use lag far behind those targeting plant diversity per se. Numerous plant-related cultural practices are endangered or have already vanished; thus, investigation, salvage, research, conservation, inheritance and revitalization are urgently needed [5, 6].

As a historically nomadic ethnic group, the Mongolian people have accumulated unique wisdom in the grazing and management of five domestic animal species, livestock disease prevention and treatment, and other related practices [7, 8]. Such wisdom has supported the survival and reproduction of both local human communities and livestock populations while contributing to the conservation of the grasslands on which they depend for their livelihoods [9, 10]. The knowledge of plant perception and utilization developed by Mongolian communities, namely TBK, constitutes a core research domain of ethnobotany. In China, Mongolian people are primarily distributed in the Inner Mongolia Autonomous Region, with

smaller populations found in other provinces, including Xinjiang, Qinghai, and Gansu [11]. In northern China, Inner Mongolia was the first region to promote and conduct ethnobotanical research [12]. Since 1984, researchers have conducted numerous ethnobotanical surveys based on ethnobotanical theories and methods [12–14]. For example, a study of wild forage plants utilized by the Mongolian people in Arhorchin Banner of Inner Mongolia reported 513 plant species [15], and another study investigating wild vegetable plants utilized by the Mongolian people in Ejina, Arhorchin Banner, Hure Banner, and Ordos reported 75 species and two varieties [16]. In addition, an ethnobotanical study conducted in the Bairin Area of Inner Mongolia reported 40 medicinal plant species [17]. A total of 204 medicinal plants, 116 forage plants and 53 edible plants have been documented by ethnobotanical studies on wild plants carried out by Han, Mongolian and Tibetan people in the Gansu–Ningxia–Inner Mongolia intersection zone [18–20]. However, compared with the volume of ethnobotanical research in southwestern China, studies on ethnic minorities in northern China remain very limited, and much TBK remains to be explored and documented [21].

Field survey methods, mainly semistructured interviews, focus group discussions and participatory observation, are typically used in ethnobotanical research as a direct source of recorded TBK [22]. Sourcing secondary data from published documentary archives serves as an essential, albeit underappreciated, avenue in ethnobotanical research [23]. Previous TBK studies based on secondary sources have focused predominantly on ancient classics and early expedition records [24, 25], including ethnobotanical analyses of ancient Mongolian literature and expedition documents from Mongolian inhabited areas [26–28]. However, contemporary ethnic minority publications (e.g., ethnic popular science magazines) that document TBK

derived from rural areas or marginalised communities have received extremely limited scholarly attention. Given the ongoing rapid loss of global indigenous languages and their associated traditional knowledge [29], as well as the fast iteration of modern digital media, indigenous knowledge scattered in historical magazines, local manuscripts, and paper archives is facing rapid oblivion and marginalization [30]. Under these severe conditions, the systematic salvage and taxonomic verification of the TBK recorded in historical publications of ethnic minorities may help bridge gaps in existing field surveys and are therefore of great urgency and practical significance.

Founded in 1980, the Mongolian-language magazine *Sinjilex Uxagan* (Uyghur-style Mongolian script: , Cyrillic Mongolian: ШИНЖЛЭХ УХААН, Latin transliteration: *Sinjilex Uxagan*, translated as "Science", hereafter referred to as SLX) documents abundant Mongolian traditional knowledge. It is the first comprehensive popular-science magazine of natural sciences published in Uyghur-style Mongolian script in the Inner Mongolia Autonomous Region, China [31] (Fig. 1). For Mongolian residents in remote pastoral areas with low literacy in Chinese, the magazine served as a vital channel through which to acquire practical science and technology in their native language and improved their scientific literacy [32]. By launching special columns such as "Mongolian Traditional Knowledge" [33], it transformed the transmission of indigenous cultural knowledge, which previously was transmitted solely through oral traditions [34]. It extensively encouraged contributions of traditional knowledge from diverse community groups, including herders, Mongolian medical practitioners and teachers, and offered publicly published outlets for scattered oral folk knowledge. Such knowledge was thereby converted into stable paper-based archives, which

formed a paper-document repository of traditional knowledge corecorded by local communities.

Figure 1 Archival and bibliographical artifacts of the inaugural issue of *Sinjilex Uxagan*. (a) Front cover; (b) Back cover; (c) Table of contents in traditional Mongolian script; (d) Opening text in lieu of an inaugural editorial

The Mongolian TBK concerning plant perception and utilization published in this magazine represents a particularly valuable repository of local ecological wisdom. Over its four decades of publication, it has reached a broad readership and served as an important channel for disseminating TBK in Inner Mongolia. However, to date, no study has systematically reviewed the TBK documented in this publication, evaluated the quality of this knowledge, or examined its significance for contemporary biocultural conservation.

Taking all the documents published in SLX over its 40-year publication period as the data source, this study systematically extracted and verified the Mongolian TBK embedded within these materials. The specific research objectives were: (1) to comprehensively identify and catalog all the plant taxa recorded in SLX, including their local Mongolian names, plant parts used, and traditional uses; and (2) to construct a regional comparative corpus consisting of 72 previously published ethnobotanical documents, develop and apply a standardized five-category comparative coding system (+, +E, +R, +D, *), and quantitatively assess the consistency, extendability, and originality of the TBK documented in SLX relative to the literature.

By extending the scope of ethnobotanical research to contemporary ethnic minority popular science literature, this study not only provides multi-decadal empirical evidence for the

sustainable utilization of plant resources across the arid and semiarid Eurasian steppe but also offers scientific references for the coordinated conservation and intergenerational transmission of biocultural diversity within nomadic ecosystems.

Materials and Methods

Collection of Research Materials

From its founding in 1980 until 2013, the Mongolian-language magazine SLX was published and distributed by Inner Mongolia Science and Technology Press, based in Chifeng, Inner Mongolia, China. Its readership covered broad groups, including herders, young students, and employees of enterprises and public institutions. The magazine's mission was "to popularize scientific and technological knowledge, support agricultural and pastoral production and livelihood enhancement, and cultivate local science popularization teams". During the 1980s and 1990s, the magazine enjoyed a broad readership and high circulation [32]. At the end of 2013, the magazine's publishing rights were transferred to the Inner Mongolia Publishing Group, and two separate editions were launched. Its academic edition ceased publication in 2018, whereas the popular science edition remains in circulation to the present day with a revised mission of "popularizing scientific knowledge for primary and secondary school students" and maintains a certain subscription volume among primary and secondary schools [33]. Currently, the magazine is edited and published by the Inner Mongolia Education Press (National Unified Serial Number: CN 15-1009; International Standard Serial Number: ISSN 1005-3484).

The present study takes the Mongolian-language SLX published from 1980 to 2013, together with its ongoing popular science edition launched in late 2013, as primary historical

materials. The separately published academic edition (2014–2018) was excluded from this study because of its divergent mission, target audience, and published content. Constrained by historical magazine transitions, publisher changes, and collection-preservation conditions, no single institution holds a complete continuous collection of all SLX issues across its 40-year publication history.

Accordingly, the research team implemented multi-source collection and integration of historical materials. Between March 2022 and September 2022, archival investigations were conducted at historical publishing institutions, including the Inner Mongolia Science and Technology Press and the Inner Mongolia Education Press, as well as major literature repositories such as the Inner Mongolia Library and the Library of Inner Mongolia Normal University. As the magazine did not have an electronic edition, each issue was scanned in its entirety and converted into high-resolution PDF format for text retrieval and documentary analysis. Ultimately, the complete set of magazine issues covering its 40-year publication span (1980–2020) was reconstructed (Table 1).

Table 1 Sources of magazine issues (1980–2020)

No.	Magazine Issues (Year/Issue No.)	Source Institution
1	1980(01)–1997(06)	Inner Mongolia Science and Technology Press
2	2000(06), 2015(01)–2020(06)	Inner Mongolia Education Press
3	1998(01), 2000(01)–2000(05), 2004(02), 2008(01)–2014(06)	Inner Mongolia Library
4	1998(02)–1999(06), 2001(01)–2004(01), 2004(03)–2007(06)	Library of Inner Mongolia Normal University

169

170 Over its 40-year publication span, the magazine released one inaugural issue in 1980, four
171 issues in 1981, and generally maintained a bimonthly publication schedule (six issues
172 annually) thereafter, with the exception of 1986, during which only two issues were published.
173 In addition, Issues 5 and 6 of 1995 were published as a single combined issue. Consequently,
174 the complete archival corpus comprises 234 physical bound issues. A comprehensive census
175 across this 40-year corpus documented 6,271 popular science articles covering 12,924 pages
176 in total.

177 ***Research Methods***

178 This study was conducted primarily by means of semistructured interviews, documentary
179 research, field survey and taxonomic verification, and comparative analysis.

180 (1) Semistructured Interviews

181 To explore the founding background and evolutionary trajectory of SLX, as well as the
182 roles and practical pathways of this ethnic minority-language medium in documenting and
183 disseminating TBK, the research team carried out semistructured interviews from March 2023
184 to January 2024. The interviews were conducted in accordance with the ethical guidelines of
185 the International Society of Ethnobiology and the American Anthropological Association [35,
186 36]. Before each interview, the research purpose and intended use of the information were
187 explained to the informants, and records were made after oral informed consent had been
188 obtained [37]. A total of 15 key informants were interviewed, with ages ranging from 16 to 72
189 years. The cohort encompassed three distinct stakeholder groups: five editorial staff members
190 representing successive generations of the magazine's editorial and review teams; four

contributing authors who had published TBK-related articles in SLX, including the author of the single most botanically comprehensive TBK treatise documented in the magazine; and six representative readers comprising herders, grassroots educators, and students. Notably, this group included a high school teacher who managed school subscriptions and possessed two years of grassroots pastoral work experience, providing firsthand empirical insights into the circulation and reception of SLX within both educational institutions and herding communities. We traveled to Hohhot and Chifeng to conduct face-to-face semistructured interviews with informants residing there, while for those located in other regions, we carried out the interviews remotely via online platforms. The interviews focused mainly on manuscript sources, authors' original intentions and experiences in documenting TBK, reader-feedback interaction modes, and the origin and evolution of featured columns over the 40-year period, especially the "Mongolian Traditional Knowledge" column. These interviews provided qualitative evidence for interpreting the communication context of traditional knowledge.

(2) Documentary Research

Given the existing limitations of computer language-processing techniques in automatic semantic recognition for long texts written in Uyghur-style Mongolian script and to guarantee research accuracy, our team adopted a full-sample manual close-reading approach. Every article published in SLX across its 40-year span was screened paragraph by paragraph. Entries documenting Mongolian peoples' perception, nomenclature, and utilization of plants were identified and extracted from both the "Mongolian Traditional Knowledge" column and scattered articles in other columns, such as "Veterinary Window" and "Friends of Health". For

each plant use record, a structured database was constructed with detailed information, including local Mongolian names, categories of traditional uses, plant parts used, processing and preparation methods, and specific application scenarios.

(3) Field Survey and Taxonomic Verification

To guarantee the rigor and scientific validity of plant species identification, this study drew on long-term ethnobotanical field survey datasets accumulated by our research team since 1984 across the Mongolian Plateau, totaling 57 references (Supplementary Table S1). Survey areas covered most administrative jurisdictions of the Inner Mongolia Autonomous Region, including Hulunbuir League, Hinggan League, Tongliao City, Chifeng City, Xilingol League, Ordos City, Bayannur City, and Alxa League. Additional field sites included northwestern Xinjiang, China, and Mongolia. These investigations provided firsthand field data and physical voucher specimens concerning traditional plant use by Mongolian communities for the present study.

Combined with ethnobotanical verification, the present study performed a taxonomic assignment and validation of traditionally utilized plant species recorded in SLX on the basis of the abovementioned field survey outcomes of our research team. First, plant taxa documented in SLX were verified from the perspective of plant taxonomy. With local Mongolian names, habitat types, life forms, and descriptive morphological features recorded in the original texts as core clues, species identification was carried out mainly with reference to *Flora of Inner Mongolia* (third edition) and *Flora of China* [38–41], supplemented by the *Manual of Names of Seed Plants in Inner Mongolia* and *Mongolian–Chinese–Latin Names of Seed Plants* [42, 43]. Given that the local Mongolian names of special-use categories may

differ from those of standard Mongolian plants, this study specifically consulted relevant thematic studies and authoritative reference works. For plants utilized in tea, ethnobotanical studies specifically focusing on tea-use plants of the Mongolian Plateau were consulted to facilitate precise tracing of local names and verification of species correspondence [44–47]. For medicinal plants, classical monographs and authoritative reference works on traditional Mongolian medicine were consulted to standardize and align the terminology of their functional descriptions [48–51]. Second, for folk plant names with ambiguous attributions or cases of synonymy recorded in the periodical, we verified the accuracy and identity of the information through multisource evidence by integrating our research team’s empirical fieldwork records with the aforementioned ethnobotanical and botanical literature. Finally, all internationally accepted scientific names of the plants were standardized and validated according to the World Flora Online (WFO) [52], with cross-checking against the *Flora of China* (FOC) [53].

(4) Comparative Analysis

To evaluate the value of the TBK documented in SLX in terms of knowledge consistency, complementarity, and originality within regional ethnobotany, this study constructed a regional comparative corpus comprising 72 ethnobotanical publications. The corpus consists of two components: 57 published ethnobotanical papers on Mongolian communities produced by our research team since 1984 and 15 additional ethnobotanical studies on Mongolian communities retrieved and screened from CNKI, Web of Science, and Google Scholar. The core documents used for comparative analysis are listed in the reference list following the principle of representative citations.

To guarantee rigorous and objective quantitative statistics, a structured comparative coding system was developed and applied for comparative analysis against the aforementioned 72 prior ethnobotanical publications.

+ (Consistent record): The SLX record is fully consistent with records found in the 72 prior publications.

+E (Extended use): The plant has been documented in the literature, yet SLX reports entirely new use categories.

+R (Rich earlier record): Plants have been documented in the literature, with broader and more detailed use categories or specific applications reported in previous works.

+D (Divergent use): The plant has been documented in the literature, but SLX records different uses.

*** (Novel record):** Distinctive utilized species not reported in the 72-document Mongolian ethnobotany corpus.

For species marked with * (no prior ethnobotanical records) or +D (divergent uses), classical traditional Chinese medical texts, authoritative monographs, and modern phytochemical studies were further adopted as supplementary references for case-by-case verification. These supplementary materials, however, were not incorporated into the unified five-category quantitative coding metrics.

Results

Sorting of Articles Related to TBK

A total of 41 articles involving Mongolian TBK were screened from the papers published in SLX (Table 2).

Article Title	Author Information ¹⁾	Publication Source ²⁾	Mode of Documentation ³⁾	Ref. Code ⁴⁾
Coral Lily (<i>Lilium pumilum</i>)	Erdenbayar	OA	MA	19800102
On the Cultivation of Broomcorn Millet (<i>Panicum miliaceum</i>)	Tegus (Native of Chifeng, Inner Mongolia)	OA	SA	19810204
Grazing Methods for the "Five Livestock"	L. Nimaasor; D. Badamadöji	TL	SA	19820505
Grazing Techniques and Husbandry for Sheep Herds	D. Bat (Mongolia)	TL	SA	19820606
Traditional Mongolian Bone-Setting Methods	Bao J.S.	OA	SA	19830408
	Transliterated into traditional Mongolian script from			
Book of Fifty-Three Traditional Therapies	Manchu-Mongolian by Lubsanjambaa (Original author unknown)	TL	SA	19840122
Traditional Therapies for Cold Hernia Syndrome	Medeltu	OA	SA	19850346
Trees that Forecast Rainfall	Harxu	OA	MA	19860141
Traditional Mongolian Cradle (Ölziikei)	Eerxembat	OA	SA	19880309

Desert Poplar (<i>Populus euphratica</i>)	Secenbat	OA	MA	19880540
The Mongolian Horse	Gonbuzab	OA	SA	19880553
Dietary Utilization of Wild Edible Plants by the Mongolian People	B. Zadanba (Herder)	OA	MA	19890331
Traditional Mongolian Food: Fried Millet	Burenbayari	OA	MA	19890614
Therapeutic Methods for Livestock Diseases	Galcang (Veteran Mongolian medical practitioner)	TL	SA	19900304
Therapeutic Methods for Livestock Diseases	Galcang (Veteran Mongolian medical practitioner)	TL	SA	19900412
Precious Medicinal Material: Ginger (<i>Zingiber officinale</i>)	Tungglag	OA	SA	19910343
Buckwheat (<i>Fagopyrum esculentum</i>)	Kang Y. S.	TE	MA	19910652
Broomcorn Millet (<i>Panicum miliaceum</i>)	N. Engxe	OA	MA	19930126
Splendid Achnatherum (<i>Neotrinia splendens</i>)	N. Engxe	OA	MA	19930210
Grassleaf Sweetflag (<i>Acorus calamus</i> / <i>Acorus gramineus</i>)	Mongxe	OA	MA	19930211
A Preliminary Discussion on the Utilization of Berberis Medicinal Resources in Inner Mongolia	Lobusong	OA	MA	19940204

Plants Closely Bound to Mongolian				
Daily Life	Mongxe	OA	MA	19940228
Plants Related to Daily Subsistence	Mandula	OA	MA	19940525
Siberian Apricot (<i>Prunus sibirica</i>)	Dabshilt	OA	MA	19940608
Siberian Crabapple (<i>Malus baccata</i>)	Dabshilt	OA	MA	19940610
Health-Promoting Wild Vegetables	Urenceceg	OA	MA	19960537
Four-Season Nomadic Pastoralism of the Mongolian People	Toli	OA	SA	19970204
Prevention and Treatment of Livestock				
Diseases Using Indigenous Medicinal Plants	Colu; Damdinsurong	OA	MA	19970418
Prevention and Treatment of Livestock				
Diseases Using Indigenous Medicinal Plants	Colu; Damdinsurong	OA	MA	19970510
Chinese Hawthorn (<i>Crataegus</i> <i>pinnatifida</i>)	Dabshilt	OA	MA	19970534
Prevention and Treatment of Livestock				
Diseases Using Indigenous Medicinal Plants	Colu; Damdinsurong	OA	MA	19970618
Hemp-Leaved Nettle (<i>Urtica</i> <i>cannabina</i>)	Subuda	OA	MA	19970620

Prevention and Treatment of Livestock

Diseases Using Indigenous Medicinal Colu; Damdinsurong OA MA 19980110

Plants

Prevention and Treatment of Livestock

Diseases Using Indigenous Medicinal Colu; Damdinsurong OA MA 19980214

Plants

Prevention and Treatment of Livestock

Diseases Using Indigenous Medicinal Colu; Damdinsurong OA MA 19980322

Plants

Therapeutic Applications of Green

Hascolu OA MA 20040127

Vegetables

Effects and Functions of Aconitum

Cagan; Chen Liang OA SA 20070513

kusnezoffii Preparations

Lianhua (Teacher at the

Hemp-Leaved Nettle (*Urtica*

Mongolian Kindergarten in

OA MA 20080311

cannabina)

Arhorchin Banner, Inner

Mongolia)

Yellowhorn (*Xanthoceras sorbifolium*) Heceltu

OA MA 20090506

A. Ulji (Public official in

Conservation and Utilization of

Bairin Right Banner, Inner

OA MA 20100617

Natural Green Foods

Mongolia; long engaged in

animal husbandry; deceased)

280

281 1) Author Information: Extracted from verifiable author attributes in original texts, including name, occupation,
282 work unit and affiliated region. Author names in the original traditional Mongolian script were uniformly
283 transliterated into a Latin script for academic readability.

284 2) Article Source: OA indicates an *Original Article*; TE denotes a *Translated-edited Article*; and TL represents a
285 *Transliterated Article*.

286 3) Publication format: MA indicates a *Monographic Article* (published in specialized columns); SA denotes a
287 *Scattered Article* (articles published dispersedly across other general sections).

288 4) Reference Code (Ref. Code): Formatted as YYYYPPSS, where YYYY indicates the year of publication, PP
289 indicates the issue number, and SS denotes the starting page number.

290 On the basis of the textual organization pattern of the TBK in the retrieved corpus, the
291 selected eligible articles are classified into two distinct categories: monographic articles (MA),
292 totaling 27 articles (65.9%), which introduce one or multiple plant taxa in a concentrated,
293 full-text dedicated manner; and scattered-content articles (SA), totaling 14 articles (34.1%),
294 where traditional plant knowledge is embedded as fragmented excerpts within thematic
295 articles covering ethnic medicine, pastoral livelihoods, and folk culture.

296 In terms of article source classification, the final corpus consists of 35 original articles (OA,
297 85.4%), 5 transliterated articles (TL, 12.2%), and 1 translated-edited article (TE, 2.4%).
298 Original articles clearly form the dominant component of the full corpus. The documented
299 occupations of identifiable contributing authors include veteran Mongolian physicians,
300 pastoral herdsmen, grassroots teachers, and public-sector employees. Original articles account

for 96.3% (26 articles) of all previously defined monographic articles. This indicates that most of the original articles published in this magazine that specifically elaborate on the Mongolian people's knowledge and utilization of plants were written by local authors (Table 3).

Table 3 Statistics on sources and documentation forms of TBK-related articles published in SLX

Mode of Documentation	Original (OA)	Articles Transliterated Articles (TL)	Translated-edited Articles (TE)	Total
Monographic articles (MA)	26 (96.3%)	0 (0%)	1 (3.7%)	27 (65.9%)
Scattered articles (SA)	9 (64.3%)	5 (35.7%)	0 (0%)	14 (34.1%)
Total	35 (85.4%)	5 (12.2%)	1 (2.4%)	41 (100%)

From a temporal perspective, the volume of TBK-related articles published in the periodical presents clear phased evolutionary patterns, which are closely correlated with key shifts in the magazine's publication history (Fig. 2). The 1980–1998 interval represents the most productive phase for TBK-related article output, with a total of 35 articles (85.4% of the full corpus). The largest numbers of articles were published in 1994 (5 articles) and 1997 (6 articles). Between 2000 and 2012, the annual output of TBK-related articles declined sharply, with only scattered, intermittent records (6 articles in total). Following the formal reorientation of the magazine's editorial mandate toward science popularization for primary and secondary school students at the end of 2013, no additional TBK-focused articles were published.

Figure 2 Annual distribution trend of TBK-related articles on TBK published in SLX

(1980-2020)

Diversity of Recorded Plant Species

Following systematic textual validation and taxonomic cross-checking, a total of 124 plant taxa (120 species, three varieties, and one subspecies) belonging to 95 genera and 48 families were documented as traditionally utilized plants by the Mongolian community in the periodical. Owing to incomplete documentation of diagnostic plant morphological traits and habitat information in a small subset of articles, 10 taxa were conservatively identified only to the genus level (e.g., *Allium* sp.). The full dataset, including scientific names, local Mongolian names, use categories, utilization modes, comparative results with prior ethnobotanical studies, corresponding article retrieval codes and voucher numbers, is compiled in Table 4 and is alphabetically sorted by scientific name (Table 4). Angiosperms were absolutely dominant, comprising 121 species from 92 genera and 45 families (97.6%). Gymnosperms accounted for 1 species from 1 genus and 1 family (0.8%), and pteridophytes comprised 2 species from 2 genera and 2 families (1.6%) (Table 5).

Table 5 Composition of taxa of traditionally utilized plants recorded in SLX

Plant group	Number of families	Number of genera	Number of species and proportion	Representative species
Angiosperms	45	92	121 (117 spp., 3 var., 1 subsp.), 97.6%	Rosaceae, Asteraceae, etc.
Gymnosperms	1	1	1 (1 sp.), 0.8%	<i>Ephedra sinica</i>
Pteridophytes	2	2	2 (2 spp.), 1.6%	<i>E. hyemale</i> ; <i>P. davidii</i>
Total	48	95	124 (120 spp., 3 var., 1 subsp.),	--

Plant group	Number of families	Number of genera	Number of species and proportion	Representative species
			100.0%	

333

334 The five families with the greatest numbers of species were Rosaceae (15 species, 12.1%),

335 Asteraceae (14 species, 11.3%), Fabaceae (12 species, 9.7%), Poaceae (10 species, 8.1%), and

336 Amaryllidaceae (8 species, 6.5%). These five families contained a total of 59 species,

337 accounting for 47.6% of all the recorded species. Twelve families contained 2–5 species each

338 (34 species in total, 27.4%). The remaining 31 families each contained only one species

339 (25.0%) (Fig. 3a).

340 **Figure 3** Multidimensional characteristic analysis of traditional utilized plants recorded in

341 SLX: (a) Family-level distribution; (b) Classification of utilized plant parts; (c) Classification

342 of traditional uses

343 *Diversity of Utilized Plant Parts*

344 The utilized plant parts were classified into eight categories. Among the recorded taxa, 81

345 plant species were documented with a single part used, and 43 species were documented with

346 2–5 parts used. For instance, *Neotrinia splendens* was recorded with two usable parts, *Urtica*

347 *cannabina* with three, *Imperata cylindrica* with four, and *Nitraria roborowskii* with five. This

348 is why the total number of recorded plant use entries exceeds the number of plant species. In

349 terms of specific categories, fruits and seeds represented the most widely utilized plant parts,

350 involving 41 species (20.5%). The leaves of 36 species (18.0%) were the second most

351 common, and these included mainly mature and young leaf-related organs. Stems (30 species,

15.0%) included herbaceous culms (21 species), woody branches (7 species), bark (1 species), and trunk exudate (1 species). Aerial parts (28 species, 14.0%) referred to composite harvested materials such as above-ground stems, leaves, and young shoots. Whole-plant utilization (22 species, 11.0%) involved harvesting and using complete individuals, including roots, stems, and leaves. Underground organs (20 species, 10.0%) included roots (12 species), rhizomes (4 species), root bark (1 species), bulbs (1 species), tubers (1 species), and root tubers (1 species). Flowers and inflorescences were relatively less frequently used (16 species, 8.0%). Seven species (3.5%) had no explicit records of specific utilized parts (Fig. 3b).

Diversity of Uses

In accordance with their documented uses, the traditionally utilized plants recorded in the SLX were assigned to six use categories: medicinal (69 species), edible (46), fodder (38), daily life materials (9), cultural uses (6), and other uses (11) (Fig. 3c). The "other uses" included ecological (4), industrial (3), ornamental (2), phenological-indicator (1), and natural standard-reference (1) uses. Ninety-two species were recorded under a single use category, whereas 32 species were recorded under two to seven categories. For example, *Malus baccata* was documented for edible, medicinal, material (for production and daily life), cultural, tea, and fodder uses, among others, which explains why the number of use records exceeds the number of plant species.

Medicinal Plants

A total of 69 medicinal plant species were recorded, accounting for 38.5% of all the documented use reports. These included 39 species for veterinary use, 25 species for human medicinal use, and 5 species for both human and veterinary purposes. They belonged to 60

genera across 34 families, with 14 species from the Rosaceae, 7 from the Asteraceae, 6 from the Fabaceae, and 1–3 species from each of the remaining families. A wide range of plant parts, such as whole plants, underground organs, fruits, and leaves, were utilized. Most are common plants, including *Plantago asiatica*, *Quercus mongolica* and *Taraxacum mongolicum*, which are easy to harvest and require simple processing.

The traditional veterinary knowledge recorded in the periodical focused primarily on disease treatment for the five core traditional Mongolian domestic livestock (camels, horses, cattle, goats, and sheep), with extremely limited documentation for other domestic animals (only two species were recorded for pig disease treatment). During periods of limited medical resource accessibility in remote pastoral regions, the periodical published practical guidance covering plant morphological traits, optimal harvesting seasons, and basic application protocols. This content not only provided low-cost daily healthcare and disease prevention guidance for grassroots pastoral communities but also directly supported local herdsmen in implementing evidence-based, sustainable livestock husbandry management.

Notably, among the 30 human-medicinal plants recorded in the magazine, 12 species (40.0%) were also documented as edible (Fig. 4). For example, *Prunus sibirica* was recorded for edible fruits; its seeds can be pressed for oil, and the seed oil is used to treat coughs, burns, yellow-fluid disorders (Shar-us), and hair loss. The above-ground parts of *Allium polyrhizum* can be pickled for food; they also serve as a stomach-tonic remedy. These findings demonstrate that Mongolian people long recognized the homology of food and medicine [100]. They held a rudimentary understanding that "many plants provide not only calories but also micronutrients and other bioactive compounds beneficial to health" [101].

Figure 4 The number of traditional edible and food-medicine homology plants

Edible Plants

A total of 46 edible plant species were recorded, accounting for 25.7% of all the documented use reports. These species belonged to 37 genera across 28 families, including 6 species from the Rosaceae, 5 from the Amaryllidaceae, 4 from the Chenopodiaceae, and 1–3 species from each of the remaining families. Edible parts were concentrated mainly in fruits, seeds and leaves. As some species possess multiple edible uses, 63 edible-function records have been published. These included wild fruits (11 species), wild vegetables (13 species), tea-substitute plants (9 species), wine-making raw materials (5 species), oil-extracting plants (5 species), grain-substitute plants (5 species), condiment plants (4 species), sugar-source plants (2 species), fermentation plants (1 species), nuts (1 species), and 7 species with unspecified edible modes (Fig. 5).

Figure 5 Classification and number of edible plants recorded in SLX

Constrained by climatic and geographical conditions, local communities are prone to shortages of plant resources such as fresh vegetables, tea, and spices. By publishing information on traditional edible plants, the magazine not only passed on experiences of obtaining dietary nutrition from local wild plant resources to readers but also documented the traditional wisdom of Mongolian people in coping with environmental vulnerability and seasonal food scarcity. For instance, *Malus baccata* was recorded: Its fresh fruits aid digestion, and they can be stored in animal rumens for consumption until the following spring. The fruits steeped in boiling water during severe winters can relieve coughs, a cold stomach, cold hands and feet, and rheumatism. For *Quercus mongolica*, dried bark is harvested in autumn,

cleaned and sun-dried, stir-fried with butter, and brewed for tea. Leaves of *Rumex acetosa* and *Oxybasis glauca* are boiled, squeezed dry, and cooked together with milk and cream. Leaves of *Chenopodium hybridum* are blanched, rinsed in cold water, and simmered with dairy products until pale yellow for consumption; the plant can also be used for wine-making, oil extraction, and sauce production.

Forage Plants

A total of 38 forage plant species were recorded, accounting for 21.2% of all the documented use reports. They belonged to 25 genera across 14 families, including 8 species from Poaceae, 6 from Asteraceae, 5 each from Fabaceae and Amaryllidaceae, 3 from Chenopodiaceae, and 1–2 species from each of the remaining families. The utilized parts were mainly aboveground plant parts and leaves. The documentation of forage plants supported the maintenance of grassland livestock productivity and the seasonal nutritional supply for herds.

In terms of target livestock species, 36 forage plant species were documented as feed for the five traditional Mongolian livestock, while the remaining 2 species were recorded as dedicated forage for pigs. When introducing these forage resources to readers, the periodical employed widely recognized local folk terminology, such as "gaining water fat" and "gaining oil fat", and explicitly specified the corresponding optimal grazing seasons [61,102]. "Gaining water fat" refers to the spring and summer periods when vegetation sprouts, supporting the ability of livestock to recover their physical condition after long-term nutritional deprivation during the winter (5 species recorded, including *Agropyron cristatum*). "Gaining oil fat" refers to the summer and autumn period when forage is highly nutrient dense, allowing livestock to rapidly accumulate sufficient fat reserves for the upcoming cold season (6 species recorded).

Furthermore, the periodical explicitly documented 3 dedicated spring-grazing forage species, 5 summer fattening forage species, and 3 autumn fattening forage species. This recording method integrated plant phenological stages, forage functions and livestock physiological responses, reflecting the practical experience of Mongolian people in the seasonal utilization of pasture grasses. In addition, five species, namely, *Allium mongolicum*, *Allium polyrhizum*, *Caragana* sp., *Ephedra sinica* and *Urtica cannabina*, were highlighted for causing conditional poisoning in camels together with corresponding first-aid measures. This type of content effectively disseminated practical knowledge of rational feed intake regulation and toxic forage prevention and treatment among pastoral herdsman readers.

Materials Plants

A total of 9 plant species were documented in the corpus, accounting for 5.0% of all recorded plant taxa. These records embody the Mongolian community's accumulated practical experience in selecting native woody and herbaceous plant resources as raw materials for fabricating traditional daily utensils. Their applications cover components of yurts (Ger), furniture, cradles, livestock pens, baskets, ropes, and other implements. For example, stems and leaves of *Imperata cylindrica* are woven into ropes for yurt construction and umbrellas; branches of *Crataegus pinnatifida* are used to make yurt crowns (*Toono*), morin khuur (horsehead fiddle) necks and furniture.

Plants for Traditional Cultural Use

A total of 6 plant species were recorded for cultural utilization, accounting for 3.4% of the total species. These plants are involved in cultural expressions embedded in folk activities, historical traditions, and literary classics. For example, the article *Cradle* published in Issue 3

of 1988 documented records of traditional Mongolian cradle "Ölgii" made from *Salix* sp., as described in the classic historical novel *The Romance of the Blue History* by the renowned Mongolian writer Injannasi (Yinzhan Nashi)[103]. This article elaborated upon the material selection, fabrication techniques, and cultural connotations of Ölgii cradles, demonstrating how plant resources serve as both material and spiritual carriers that are deeply integrated into Mongolian literary creation, folk life, and intergenerational memory. Furthermore, the magazine records that trunks of *Crataegus pinnatifida* are used to construct the skylight of yurts for newly married couples. Its sturdy and stable root system symbolizes good fortune, while its abundant fruits represent prosperity and fertility. Trunks of *Malus baccata* are applied to fabricate yurt skylights and railings of traditional cradles, symbolizing longevity and multiple offspring; its roots can be carved into pieces for Mongolian chess games. Roasted seeds of *Panicum miliaceum* are displayed as traditional tributes in festivals and folk rituals. The Mongolian common name of *Prunus sibirica* has been adopted in local place names and personal names, and *Lilium pumilum* is frequently depicted in literary works.

Miscellaneous Uses

Beyond the major use categories described above, the magazine also records miscellaneous functions, including ecological, industrial, ornamental, phenological-indicator and natural-reference-standard uses, involving 11 plant species (6.2 % of the total species). Ecological uses (4 species, 2.2 %) reflect pastoralists' ecological knowledge of utilizing native plants for wind breaks, sand fixation and soil improvement. For instance, the well-developed root system of *Neotrinia splendens* stabilizes sand dunes and mitigates wind–sand hazards, and local experience has shown that *Populus euphratica* ameliorates saline–alkaline soils and

adapts to arid habitats. Industrial uses (3 species, 1.7 %) include extracting industrial-grade oil from seeds of *Cannabis sativa*; harvesting stem-bark fibers of *Caragana sp.* for man-made fiber production together with seed-oil extraction; and employing stems and leaves of *Neotrinia splendens* as raw materials for paper-making and artificial cotton. Ornamental uses (2 species, 1.1 %) refer to using the flowers of *Prunus sibirica* and *Lilium pumilum* for environmental beautification, reflecting appreciation for plant aesthetic values and spiritual life demands. The use of a single phenological indicator (1 species, 0.6 %) is documented in the article *Rain-predicting Trees* published in Issue 1, 1986. This study describes the unique phenomenon whereby branches and leaves of *Tamarix chinensis* produce white protuberances before rainfall, while flower color and flower abundance change with increasing rain and precipitation magnitude. Single natural-reference-standard use (1 species, 0.6 %) appears in traditional *Mongolian Therapies* (Issue 6, 2012). Within the traditional compounding procedures of Mongolian medical pills, the seeds of *Firmiana simplex* serve as a standardized natural physical reference for calibrating pill size.

The diverse utilization patterns of these plants demonstrate multilevel and multidomain perceptions and applications of plant resources held by Mongolian communities.

Comparative Analysis with Relevant Ethnobotanical Studies

A comparative analysis was conducted between the traditional plant uses documented in SLX and those reported in previous ethnobotanical studies on Mongolian people. Among the 124 plant species recorded in the SLX, 24 species exhibited utilization patterns consistent with those in prior research (+); 31 species were documented with more diverse uses in the previous literature than in the magazine (+R); 31 species showed divergent uses compared

506 with existing records (+D); 14 species included both uses documented in prior studies and
 507 novel uses not previously reported (+E); and 24 species represented new records of plant uses
 508 unreported in earlier ethnobotanical literature (*) (Table 6). Of the 124 plant species recorded
 509 in the magazine, 100 species (80.6% of the total) can be found in existing ethnobotanical
 510 publications. These statistical results largely verify the factual authenticity and unique
 511 academic research value of the traditional plant knowledge system preserved in SLX.

512 **Table 6** Numerical synthesis of plant taxa and uses across comparative coding groups

Symbol	Number	Medicine			Edible	Fodder	Material	Cultural	Miscellaneous Uses
	of species and proportion	Human	Veterinary	both					
		Medicine	Medicine						
		Medicine	Medicine						
+	24(19.4%)								
(Consistent record)		3	1	0	8	16	1	1	4
+E	14(11.3%)	3	3	4	10	7	3	3	2
(Extended use)									
+D	31(25%)	4	24	1	3	1	1	0	1
(Divergent use)									
+R	31(25%)	5	4	0	21	8	3	2	3
(Rich-earlie									

r record)									
	*								
	24(19.4%								
(Novel		10	7	0	4	6	1	0	1
)									
record)									
Total	124	25	39	5	46	38	9	6	11

513

514 *Plants with Consistent Uses (+)*

515 A total of 24 plant species belonging to 19 genera and 10 families were recorded,
516 accounting for 19.4% of all the documented taxa. The utilitarian categories documented in the
517 magazine included fodder (16 spp.), edible (8 spp.), medicinal uses (4 spp., comprising 1 for
518 veterinary medicine and 3 for human medicine), ecological uses (2 spp.), industrial uses (2
519 spp.), material uses (1 sp.), and cultural uses (1 sp.). In terms of utilitarian versatility, 18
520 species were single-use plants, while six species exhibited two to four use categories. The
521 records of these plants in the SLX are highly consistent with those from previous
522 ethnobotanical studies, confirming the reliability of the traditional Mongolian botanical
523 knowledge documented in the magazine.

524 *Extended Records of Plant Uses (+E)*

525 A total of 14 plant species belonging to 14 genera and 9 families were documented,
526 accounting for 11.3% of all the recorded taxa. The utilitarian categories recorded in the
527 magazine included medicinal uses (10 spp., comprising 3 for Veterinary Medicine, 3 for
528 Human Medicine, and 4 for both Veterinary Medicine and Human Medicine purposes), edible
529 (10 spp.), Fodder (7 spp., including 4 taxa specifically noted as toxic in excess), material (3

spp.), cultural uses (3 spp.), ecological uses (1 sp.), and ornamental uses (1 sp.). Four species were single-use plants, while ten species exhibited two to five use categories. These species have more diverse uses than those reported in previous ethnobotanical literature. The magazine recorded detailed utilization practices and empirical knowledge in depth, effectively broadening the application dimensions of the TBK. These extended uses are reflected mainly in the following three aspects:

(1) Early warning regarding toxicity and detoxification treatment for livestock poisoning.

Previous studies have reported that *Allium mongolicum*, *Allium polyrhizum*, and *Urtica cannabina* are solely forage plants, and *Ephedra sinica* was recorded as having edible megasporangiate strobili. Beyond these documented uses for the four species, this magazine notably supplemented targeted treatment protocols for livestock overfeeding poisoning (for instance, camels poisoned by excessive ingestion of *Allium mongolicum* and *Allium polyrhizum* can be treated synergistically with fatty soup gavage, mud cold compress, and bloodletting therapy), phenological toxicity warnings during specific growth stages (e.g., camels are prone to fatal bloating after feeding on *Urtica cannabina* at a height of approximately four fingers), and seasonal/climatic feed toxicity cautions (e.g., in extremely cold environments, camels consuming *Ephedra sinica* are highly susceptible to secondary cold stress, where postingestion exposure to severe wind chill can induce physiological impairment or systemic failure, potentially leading to death).

(2) Expansion of clinical application in traditional veterinary medicine. Previous studies have categorized certain plants mainly as edible, forage, or human medicinal resources. This magazine further supplemented their curative effects in traditional veterinary practices.

For example, a root decoction of *Crataegus pinnatifida* is used to treat diarrhea in lambs, tetanus, and gastrointestinal inflammation in large livestock; *Leymus chinensis* can improve the gastrointestinal function of horses; and dried rhizome powder of *Sanguisorba officinalis* is orally administered to regulate digestive tract diseases in livestock. Moreover, the almond oil of *Prunus sibirica* is used to treat livestock emaciation and pneumonia, and a fumigation formula combining *Carthamus tinctorius* and red sandalwood is used to relieve cold hernia in horses. These records reflect the in-depth extension of herdsmen's phytopharmacological understanding to the prevention and treatment of livestock diseases.

(3) Diversified expansion of material culture, craft processing and spiritual symbolism. In addition to recording medicinal and forage functions, the magazine fully explored the comprehensive value of plants in daily crafts and folk culture. For example, it documented the traditional experience of oil extraction from *Corylus heterophylla* seeds. *Crataegus pinnatifida* and *Malus baccata* are not only recognized as high-quality timber for manufacturing yurt crowns, morin khuur necks and infant Ölgii cradles but also endowed with profound folk cultural symbolism: their deep and robust roots symbolize a stable and auspicious foundation, and their abundant fruits represent the prosperity of descendants.

Plants with Divergent Uses (+D)

A total of 31 plant species belonging to 30 genera and 17 families were recorded, accounting for 25.0% of all the documented taxa. The utilitarian categories recorded in the magazine included medicinal uses (29 spp., comprising 24 for veterinary medicine, 4 for

574 human medicine, and 1 for both veterinary medicine and human medicine purposes), edible (3
575 spp.), fodder (1 sp.), material (1 sp.), and indicator (1 sp.). Twenty-eight species were
576 single-use plants, while three species were associated with two to three functional categories..

577 On the one hand, there is empirical transfer and efficacy verification from human medicine
578 to veterinary medicine. Among the 31 species with divergent uses, 24 (77.4%) show
579 discrepancies between human-medicinal and veterinary-medicinal applications. Previous
580 studies have mostly highlighted the therapeutic value of plants for humans, whereas SLX
581 primarily documented their traditional veterinary efficacy in treating livestock diseases.
582 Notably, for six of these species, despite different target recipients (humans or livestock), their
583 main pathological indications and core therapeutic effects are highly consistent. Prior studies
584 reported *Rheum rhabarbarum*, *Potentilla chinensis*, *P. longifolia* and *Rosa davurica* as
585 human-medicinal plants with the effects of clearing heat, detoxifying and regulating
586 gastrointestinal functions; in SLX, they were all documented as veterinary medicines for
587 treating digestive-tract disorders of the five traditional Mongolian livestock. Previous research
588 revealed that *Polygala tenuifolia* and *Thymus mongolicum* can treat human respiratory
589 diseases, whereas the application of SLX for treating respiratory diseases in five traditional
590 Mongolian livestock has been reported. These findings indicate that certain plant bioactive
591 compounds have similar pharmacological effects on humans and livestock. As nomadic
592 people have lived on grasslands for generations, Mongolian people have acquired such
593 traditional knowledge through long-term animal husbandry and medical practices. Moreover,
594 the magazine documented traditional treatments for surgical conditions and specific diseases.
595 Previous studies recorded *Pterocarpus indicus* for human medicinal use, while SLX

596 documented its use of a fumigation formula combined with *Carthamus tinctorius* for treating
597 cold hernia in horses. In the prior literature, *Quercus mongolica* was described as a human
598 medicine or an oral veterinary remedy for diarrhea; SLX supplemented unique practices:
599 pounded bark applied externally and secured with a saddle to treat horse-back injuries, and
600 pork from pigs fed on its fruits being consumed by humans to alleviate urinary incontinence.

601 On the other hand, some plant uses are entirely inconsistent between prior studies and the
602 magazine records. For example, the existing ethnobotanical literature mostly reports *Tamarix*
603 *chinensis* for wind-break and sand-fixation, forage and construction purposes. In contrast, the
604 use of SLX as a phenological indicator has not been covered in earlier ethnobotanical research.
605 The magazine recorded white protuberances emerging on branches and leaves of *Tamarix*
606 *chinensis* before rainfall, as well as flower-color changes prior to precipitation (more flowers
607 before heavy rain and fewer before light rain) as rainfall-forecasting signals. Further
608 documentary verification reveals that the Mongolian empirical knowledge of using *Tamarix* to
609 forecast weather recorded in this study is highly consistent with the account in *Erya Yi* written
610 by Luo Yuan in the Song Dynasty. The text states, "When rain is imminent, tamarisk foresees
611 it and emits vapor in response. Moreover, it survives frost and snow without withering; it is
612 the sage among trees; hence, the character incorporates 'sage' "[106]. This mutual
613 corroboration between the two records not only validates the acute observation and
614 accumulated experience of Mongolian folk communities regarding the phenological indicator
615 functions of plants but also reflects commonalities in traditional plant perceptions among
616 ancestors of different ethnic groups [107].

617 *Plants with More Comprehensive Records in the Previous Literature (+R)*

A total of 31 plant species belonging to 27 genera and 21 families were documented, accounting for 25% of all the recorded taxa. The utilitarian categories recorded in the magazine included edible (21 spp.), medicinal uses (9 spp., comprising 4 for veterinary medicine and 5 for human medicine), fodder (8 spp.), material (3 spp.), cultural uses (2 spp.), ecological uses (1 sp.), ornamental uses (1 sp.), and industrial uses (1 sp.). Twenty-one species were single-use plants, while ten species exhibited two to four use categories. In comparison with previous specialized ethnobotanical investigations, related literature also documented human medicine (20 spp.), food (6 spp.), fodder (6 spp.), culture (3 spp.), and ornamental uses (1 sp.) for these taxa.

The relatively truncated utilitarian documentation for these plants highlights the inherent constraints of mass popular science periodicals as secondary sources for ethnobotanical research. Constrained by limited page space across a wide array of popular natural science disciplines and by the stochastic nature of unsolicited TBK submissions, such periodicals cannot match the exhaustive, all-encompassing inventories typical of academic treatises. Furthermore, our findings indicate that the magazine likely intentionally omitted widely known domestic empirical knowledge, as well as cultural and ornamental uses—along with taxa largely detached from practical production or its scientific popularization mandate. For instance, *Allium mongolicum*, a quintessential species in ethnobotanical field surveys, received virtually no mention of its ubiquitous traditional culinary applications, such as being used as dumpling fillings, pickled, or processed into "chive flower sauce"; instead, the publication concentrated almost exclusively on its practical utility as high-grade livestock

639 Fodder and an ethnoveterinary antidote.

640 *New Records of Plant Uses (*)*

641 A total of 24 plant species belonging to 21 genera and 15 families were identified,
642 accounting for 19.4% of all the documented taxa. The utilitarian categories recorded in the
643 magazine spanned medicinal uses (17 spp., comprising 10 for human medicine and 7 for
644 veterinary medicine), fodder (6 spp., with one taxon specifically noted as toxic in excess), and
645 food (4 spp.), while material and standard natural size references were each documented for a
646 single species. With respect to utilitarian versatility, 20 species had a single documented use,
647 whereas three species and one species exhibited two and three functional categories,
648 respectively. The uses of these plants have not been reported in previous ethnobotanical
649 literature, representing original documentary supplementation and excavation of the TBK by
650 this magazine.

651 (1) New records of traditional diagnosis-treatment and preparation specifications: Multiple
652 unique folk prescriptions were documented. For example, burnt ash of *Sophora japonica*
653 seeds mixed with old cotton was applied topically with soy sauce to treat wounds,
654 *Plantago salsa* decocted with fragments of old straw hats was used to relieve urinary
655 retention, and *Juncus* sp. was applied externally to treat tinea corporis. In particular, the
656 article *Traditional Mongolian Therapies* published in Issue 6, 2012 reported that
657 powdered *Angelica sinensis* and deer antler were kneaded into pills "the size of
658 phoenix-tree seeds" with plum juice as a binder; 50 pills were taken on an empty
659 stomach daily to treat consumptive disorders. No prior Mongolian ethnobotanical
660 literature has mentioned the use of plant seeds as natural reference standards for dosage.

Textual research confirms that "the size of a phoenix-tree seed" corresponds to the physical measurement standard "pills as large as a wuzi" recorded in the classic Chinese medical text *Essential Prescriptions Worth a Thousand Gold Pieces* [104]. Modern studies indicate that "wuzi" refers to the dried mature seeds of *Firmiana simplex*, one of the standard natural size references in ancient Chinese herbal processing [105]. This finding confirms that plants not only carry the history and culture of diverse ethnic groups and communities but also serve as important media for cultural integration among different ethnic groups through mutual learning and the sharing of relevant knowledge [3].

(2) Expansion of livestock-treatment and husbandry knowledge: Seven species filled gaps in traditional veterinary and forage knowledge. For instance, *Brassica juncea* was used to treat respiratory diseases of the five traditional Mongolian livestock; a whole-plant decoction of *Hordeum vulgare* mixed with broth was fed to camels to relieve fatigue from labor; pitted fruits of *Phoenix dactylifera* were fed to treat diphtheria in horses; and *Rubus idaeus* was applied to treat coughs in camels. In terms of forage use, *Helictotrichon hookeri* and *Cancrinia discoidea* were documented as high-quality forage for fattening livestock. Additionally, warnings of the effects of toxicity- and antidote methods for camel bloating caused by *Caragana* sp. were provided.

(3) Diverse utilization in daily-life and material processing: Multi-purpose uses of *Imperata cylindrica* were recorded, including sugar-making and wine-brewing from rhizomes, cotton-like material from inflorescences, and stems-and-leaves for yurt construction. Daily-life experiences were also documented, such as cooking leaves of *Chenopodium*

hybridum and *Chenopodium stenophyllum* with dairy products, as well as their application for wine-making and oil-extraction.

In summary, the results of the systematic comparative analysis with previously published ethnobotanical literature demonstrate that the traditional plant knowledge system documented in SLX is both highly reliable (with 80.6% species-level consistency) and academically unique and complementary, with 24 completely new plant use records and 14 extended novel use cases formally identified. Its abundant vivid folk experiences provide solid data support and valuable documentary supplements for regional ethnobotanical research.

Discussion

Uniqueness and Value of Ethnic-Minority Popular Science Magazines as Secondary Data

Sources for Ethnobotany

By sorting out the TBK published in SLX over its 40-year period (1980–2020), this study taxonomically verified 120 species, 3 varieties and 1 subspecies belonging to 95 genera and 48 families. Among these documented plants, records of 80.6% of the taxa can be found in previous ethnobotanical literature. These findings provide reliable practical records with distinctive temporal features and grassroots living contexts for ethnobotanical research. Notably, 85.4% of the published TBK articles are original contributions authored by community holders of first-hand TBK, including senior Mongolian medical practitioners, herders, and grassroots teachers. The study also revealed 24 novel plant use records (*) and 14 extended plant use records (+E). These results not only rescue substantial volumes of TBK threatened by intergenerational erosion at the documentary level but also confirm that

publications contributed by local authors, such as popular ethnic minority science magazines, are promising documentary sources for ethnobotanical exploration.

When the TBK documented in SLX within the developmental trajectory of Chinese ethnobotany is examined, a unique complementary perspective for literature exploration and knowledge documentation emerges. Chinese ethnobotanical research officially commenced in the early 1980s. In 1982, Pei Shengji published his pioneering paper on 218 plant species utilized by ethnic groups in Xishuangbanna [3], after which systematic field investigations and academic documentation were gradually established. In 1984, Chen Shan initiated ethnobotanical surveys in Inner Mongolia for the first time [108]. One major finding of this study is that during this critical formative period of the discipline, the Mongolian-language magazine SLX, alongside its science popularization mission, spontaneously and continuously documented abundant TBK originating directly from Mongolian production and daily-life. This finding demonstrates the bridging role of ethnic minority popular science magazines in linking traditional knowledge and community practice. Objectively, the magazine salvages and preserves a set of vivid experiential records rooted in grassroots life for ethnobotany. Through continuous dissemination in the native language, it facilitates the dynamic inheritance and continuity of traditional knowledge within local communities. By documenting TBK from marginalised communities, SLX actively enabled many local, land-based knowledge holders to become actors in science [109].

Moreover, the traditional botanical knowledge documented in SLX provides practical ecological wisdom to tackle ongoing grassland degradation and inform ecosystem restoration in northern China. It documented plant taxa essential for sustaining fragile steppe biomes,

including sand-stabilizing shrubs (such as *Caragana* spp. and *Xanthoceras sorbifolium*), a salt-tolerant desert plant (*Populus euphratica*), and several ecologically foundational herbs (e.g., *Neotrinia splendens* and *Leymus chinensis*). The multi-purpose utilization patterns of plants documented in SLX reflect the adaptive survival wisdom of marginalized communities in maintaining ecological resilience under severe resource constraints. Crucially, the intergenerational pastoral knowledge documented in SLX—such as the precise differentiation between forage plants that promote summer water-weight gain (shui-biao, e.g., *Festuca ovina*, *Helictotrichon hookeri*, and *Olgaea leucophylla*) and those facilitating autumn fat accumulation ('you-biao', e.g., *Artemisia anethoides*, *Artemisia frigida*, and *Stipa tianschanica* var. *gobica*)—exemplifies an adaptive ecological wisdom with profound conservation implications. This is further corroborated by feature articles in SLX dedicated to traditional pastoral practices, such as Grazing Methods for the Five Livestock, Grazing Techniques and Husbandry for Sheep Herds, and Four-Season Nomadic Pastoralism of the Mongolian People, which meticulously elaborate on empirical herding strategies that offer actionable insights for sustainable rangeland stewardship. Scientifically retrieving these grassroots-embedded traditional ecological practices and mainstreaming them into contemporary grassland conservation policies and ecological restoration initiatives will not only alleviate key drivers of ecosystem degradation—habitat fragmentation and destruction (physical restructuring), over-exploitation of species (over-harvesting) [110], but also provide viable nature-based, place-based solutions for buffering climatic fluctuations and biodiversity decline across Eurasian drylands.

Limitations of the TBK Recorded in Popular Science Magazines

While the TBK featured in SLX enables indigenous communities to serve as genuine co-architects of ethnobiological science [111], SLX is fundamentally a public-oriented popular science periodical. When it is adopted as a data source for ethnobotanical research, its inherent limitations should be objectively recognized, and its social and academic values need to be evaluated dialectically. These limitations are reflected mainly in the following two aspects.

On the one hand, taxonomic and geographical information is deficient. Compared with rigorous ethnobotanical field surveys, articles in this magazine generally lack standardized Latin scientific names, systematic morphological descriptions, and detailed habitat information. Such deficiencies greatly hinder species identification, resulting in a small number of plant species recorded only with local Mongolian names that cannot be precisely verified at the species level. In this study, 10 species were conservatively identified only to the genus level. Furthermore, only a few original articles specify collection locations, while most records lack precise geographical coordinates (e.g., prefecture, banner, and county). Accordingly, species verification must rely on botanical reference books and long-term field survey datasets accumulated by the research team. On the other hand, the recording and dissemination of the TBK are constrained by dual factors: the transformation of magazine audience positioning and the shifts in Mongolian production and lifestyles. Articles concerning TBK accounted for only 6.5% of all publications in SLX over the 40-year period. From 1980 to 2013, the magazine targeted a broad readership, with pastoralists as one of its core audiences, which facilitated the publication of practical TBK closely linked to grassland animal husbandry production. However, with the rapid transformation of Mongolian

771 production modes from traditional nomadism to settled grazing and modern urbanized
772 lifestyles, the magazine revised its mission at the end of 2013 and completely repositioned
773 itself as a popular science publication for primary and secondary school students. This
774 evolutionary trajectory indicates that the documentation of traditional knowledge by public
775 science media is highly dependent on the publishing strategies of specific historical stages,
776 which exhibit prominent stage-specific characteristics and passivity. Moreover, the early
777 functional orientation of prioritizing "serving productive practices" limited the dissemination
778 resilience of traditional knowledge during media transitions. Following the shift of target
779 audiences toward adolescents, the magazine should reconstruct its knowledge discourse
780 system and explore communication approaches adapted to children's and teenagers' cognitive
781 characteristics to sustain the intergenerational inheritance of Mongolian traditional
782 knowledge—including TBK—among young Mongolian generations.

783 To further enhance the academic value of these documented data, future research can be
784 advanced from the following two dimensions. On the one hand, conduct further field
785 validation on the newly recorded plant uses (*) and extended use records (+E) identified from
786 SLX. In reference to the methodological frameworks of recent ethnobotanical field
787 investigations among Mongolian communities [112], integrate semistructured interviews,
788 participatory observation, and voucher specimen collection to verify the current survival
789 status and intergenerational inheritance dynamics of these knowledge records in
790 contemporary community production and daily practices. On the other hand, integrate
791 molecular biological and phytochemical assays with local knowledge to provide empirical
792 support for the conservation and sustainable utilization of botanical resources, as well as

ecosystem restoration and rehabilitation in northern China. Furthermore, it facilitates the transformation of locally embedded, ethnicity-specific botanical knowledge into globally shared ecological wisdom for humanity [113].

Insights into Public Dissemination, Community Voice, and Dynamic Inheritance of TBK

TBK is deeply embedded in the daily production and livelihoods of local communities, exhibiting distinct popular and practical attributes. The decades-long practice of SLX provides a valuable paradigm: local popular science media, defined as a "method-in-place" approach [114], enables TBK to circulate continuously in public daily-life beyond academic circles and establishes a public platform for community knowledge holders to voice and express indigenous experiences [115]. By honoring indigenous knowledge systems [116], such media mobilize grassroots residents in remote communities to actively articulate their traditional empirical expertise. By disseminating multidimensional plant utilization practices and grassroots experiences, the magazine effectively feeds back into human and livestock healthcare, regional ecological governance, and daily pastoral production, thereby facilitating the living transmission of traditional botanical knowledge within communities.

This experience demonstrates that future ethnobotanical work should move beyond purely academic boundaries by bridging the empirical practices of traditional knowledge holders with the scientific validation of researchers. By actively adopting public-facing approaches—such as popular science activities and place-based nature education—and, above all, securing open and unobstructed transmission channels for the TBK, such efforts can bring TBK back into the public sphere, thereby achieving the dynamic safeguarding and living inheritance of traditional ecological wisdom in modern society.

Conclusions

Taking the Mongolian-language popular science magazine *Sinjilex Uxagan*, which has been continuously published for 40 years (1980–2020), as the research source, this study systematically identified 6,271 articles from 234 physical bound volumes and ultimately screened 41 core articles documenting Mongolian TBK. A total of 124 traditionally utilized plant species, including 120 species, 3 varieties, and 1 subspecies belonging to 95 genera and 48 families, were taxonomically verified. Angiosperms accounted for 97.6% of the total species. The recorded plant utilizations involved eight categories of plant parts, among which 34.7% of the species exhibited multipart utilization (2–5 parts). All traditional uses were classified into six major categories, dominated by medicinal uses (69 species), edible uses (46 species), and forage uses (38 species). Quantitative comparison revealed that 80.6% of TBK records were highly consistent with previous ethnobotanical literature. Moreover, 24 novel use records (*) and 14 extended use records (+E) that have not been fully documented in prior studies were systematically identified in this study.

The TBK recorded in this magazine exhibits a strong livelihood orientation and practical characteristics, reflecting the survival wisdom of Mongolian nomadic communities for the intensive and multifunctional utilization of plant resources across the Eurasian steppe. This study confirms that ethnic minority popular science magazines, with a high proportion (85.4%) of original contributions from traditional knowledge holders, including senior Mongolian medical practitioners and grassroots herders, provide valuable temporal and spatial complements to mainstream academic field investigations. These vernacular public media embody the unique bridging function of the "method-in-place" paradigm in rescuing and

preserving folk archives and empowering community voices. Considering the taxonomic and geographical deficiencies of early publications, as well as the knowledge discontinuity caused by the magazine's audience transformation in 2013, future research should include in-depth field validation and modern experimental verification of the newly discovered and extended plant use records. Furthermore, by relying on new media communication, digital archiving, and local nature education, innovative popular science pathways targeting adolescents and modern society should be developed to promote the cross-media and intergenerational living inheritance of the TBK. Such strategies can effectively support the conservation of biocultural diversity.

Declarations

Abbreviations

SLX:the Mongolian-language magazine *Sinjilex Uxagan*

Ethical Approval and Consent to Participate

Ethical approval was not required for this study as it primarily involved historical documentary analysis. Informed consent was obtained from all participants prior to the semi-structured interviews.

Consent for Publication

Not applicable.

Availability of Data and Materials

All data generated or analysed during this study are included in this published article and its supplementary information files.

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

S designed the study, completed the textual research of botanical species and wrote the manuscript. N and W were responsible for the collection and collation of the data from the literature. K revised and reviewed the article. All the authors reviewed the manuscript.

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References

1. Pascual U, Balvanera P, Anderson CB, Chaplin-Kramer R, Christie M, González-Jiménez D, et al. Diverse values of nature for sustainability. *Nature*. 2023;620:813-23. doi:10.1038/s41586-023-06406-9.
2. Redvers N, Celidwen Y, Schultz C, Horn O, Githaiga C, Vera M, et al. The determinants of planetary health: an Indigenous consensus perspective. *Lancet Planet Health*. 2022;6(2):e156-63. doi:10.1016/S2542-5196(21)00354-5.
3. Pei SJ. A preliminary study of Xishuangbanna ethnobotany. In: Redai zhiwu yanjiu lunwenji [Collected papers in tropical botanical research]. Kunming: Yunnan People's Publishing House; 1982. p. 1-21. (in Chinese)
4. Cheng Z, Zhang Q, Long CL. Research status of ethnobotany (2017–2022). *Biodivers Sci*.

- 881 2022;30(7):22372. doi:10.17520/biods.2022372.
- 882 5. Long CL, Zhang Q. Proposal to use "Renwen Zhiwuxue" as the official Chinese name for
883 Ethnobotany. Biodivers Sci. 2025;33(9):25223. doi:10.17520/biods.2025223. (in
884 Chinese)
- 885 6. Cheng Z, Lin S, Wu Z, Lin C, Zhang Q, Xu C, et al. Study on medicinal food plants in
886 the Gaoligongshan Biosphere Reserve, the richest biocultural diversity center in China. J
887 Ethnobiol Ethnomed. 2024;20:10. doi:10.1186/s13002-023-00638-9.
- 888 7. Editorial Board of Encyclopedia of Mongol Studies. Mengguxue baike quanshu (Yixue
889 juan) [Encyclopedia of Mongol studies (Medicine volume)]. Hohhot: Inner Mongolia
890 People's Publishing House; 2002. (in Chinese)
- 891 8. Fernandez-Gimenez ME. The role of Mongolian nomadic pastoralists' ecological
892 knowledge in rangeland management. Ecol Appl. 2000;10(5):1318-26.
893 doi:10.1890/1051-0761(2000)010[1318:TROMNP]2.0.CO;2.
- 894 9. Zhang Y, Shao C, Chen J. Why does the nomadic history last three thousand years in
895 Mongolian Plateau: an analysis of the relationship among grassland, livestock and
896 population. J Arid Land Resour Environ. 2019;33(6):40-5.
897 doi:10.13448/j.cnki.jalre.2019.166. (in Chinese)
- 898 10. Chao O, Reyes-García V, Molnár Z, Li X. Living knowledge: persistence and adaptation
899 of traditional ecological knowledge in East Ujimchin, Inner Mongolia, China. Ecol Soc.
900 2025;30(4):39. doi:10.5751/ES-16447-300439.
- 901 11. Zhang Y, Wurhan, Sachula, Yongmei, Khasbagan. Ethnobotanical profiles of wild edible
902 plants recorded from Mongolia by Yunatov during 1940–1951. Hist Philos Life Sci.

- 2021;43(3):100. doi:10.1007/s40656-021-00428-0.
12. Chen S, Khasbagan. Menggu gaoyuan minzu zhiwuxue yanjiu [Ethnobotanical studies on Mongolian Plateau]. Hohhot: Inner Mongolia Education Press; 2002. (in Chinese)
13. Pei SJ. Ethnobotany and exploitation of plant resources. *Acta Bot Yunnanica*. 1988;Suppl 1:135-44. (in Chinese)
14. Martin GJ. *Ethnobotany: a methods manual*. London: Chapman & Hall; 1995.
15. Khasbagan, Pei SJ. Ethnobotany of forage plants: a case study in Arhorchin Banner of Inner Mongolia. *Acta Pratacult Sin*. 2000;9:74-81. (in Chinese)
16. Khasbagan, Suyalatu. Neimenggu yesheng shucai ziyuan yu minzu zhiwuxue yanjiu [Wild vegetable resources and ethnobotanical study in Inner Mongolia]. Beijing: Science Press; 2008. p. 33-52. (in Chinese)
17. Wurchaih, Huar, Menggenqiqig, Khasbagan. Medicinal wild plants used by the Mongol herdsmen in Bairin Area of Inner Mongolia and its comparative study between TMM and TCM. *J Ethnobiol Ethnomed*. 2019;15(1):32. doi:10.1186/s13002-019-0300-9.
18. Xie J, Luo CQ, Yang XW, Ren Y, Zhang XS, Chen HR, et al. Study on wild medicinal plant resources and their applied ethnology in multiethnic areas of the Gansu–Ningxia–Inner Mongolia intersection zone. *J Ethnobiol Ethnomed*. 2023;19(1):18. doi:10.1186/s13002-023-00585-5.
19. Xie J, Liu XQ, Luo MX, Liu FS, Liu S, Zhao YX, et al. Ethnobotanical study of traditional forage plants in the Gansu–Ningxia–Inner Mongolia junction zone: conservation and sustainable utilization for animal husbandry. *J Ethnobiol Ethnomed*. 2023;19(1):53. doi:10.1186/s13002-023-00625-0.

- 925 20. Jia XH, Zhao YX, Zhu YY, Zeng X, Liang XH, Xie J, et al. Ethnobotany of wild edible
926 plants in multiethnic areas of the Gansu–Ningxia–Inner Mongolia junction zone. *J*
927 *Ethnobiol Ethnomed*. 2022;18:53. doi:10.1186/s13002-022-00549-1.
- 928 21. Li S, Zhang Q, Li Y, Wu XX, Wang JY, Long CL. Ethnobotanical study on wild edible
929 plants in the Kuancheng Traditional Chestnut Eco-Planting System, a globally important
930 agricultural heritage system in Hebei, China. *J Ethnobiol Ethnomed*. 2026;22:935.
931 doi:10.1186/s13002-026-00935-z.
- 932 22. Martin GJ. *Ethnobotany: a methods manual*. 1st ed. London: Routledge; 2004.
933 doi:10.4324/9781849775854.
- 934 23. Pei SJ, Huai HY. *Ethnobotany*. Shanghai: Shanghai Scientific and Technical Publishers;
935 2007. p. 54-5. (in Chinese)
- 936 24. Silva TC, Medeiros PM, Balcázar AL, Araújo TAS, Pirondo A, Medeiros MFT. Historical
937 ethnobotany: an overview of selected studies. *Ethnobiol Conserv*. 2014;3:4.
938 doi:10.15451/ec2014-6-3.4-1-12.1.
- 939 25. Chen CM, Chen YH. Ethnobotanical content in the monograph *Nanfang Caomuzhuang*
940 (Book of Southern Vegetation). *Chin Wild Plant Resour*. 2001;20:19-20. (in Chinese)
- 941 26. Khasbagan. Study on wild edible plants in "The Secret History of the Mongols". *J Arid*
942 *Land Resour Environ*. 1996;10:87-94. doi:10.13448/j.cnki.jalre.1996.01.014. (in
943 Chinese)
- 944 27. Sharina. *Ethnobotanical study on Imperial Manchu-Mongolian Combination Document*.
945 Hohhot: Inner Mongolia Normal University; 2009. (in Chinese)
- 946 28. Liu GX, Wurheng, Zhang YY, Guo SR, Yongmei, Khasbagan. A historical and

- 947 ethnobotanical study on local botanical knowledge recorded in the book "Mongolia and
948 Amdo and the Dead City of Khara-Khoto". J Ethnobiol Ethnomed. 2021;17:36.
949 doi:10.1186/s13002-021-00443-2.
- 950 29. Cámara-Leret R, Bascompte J. Language extinction triggers the loss of unique medicinal
951 knowledge. Proc Natl Acad Sci USA. 2021;118:e2103683118.
952 doi:10.1073/pnas.2103683118.
- 953 30. Christen KA. Does information really want to be free? Indigenous knowledge systems
954 and the question of openness. Int J Commun. 2012;6:2870-93.
- 955 31. Sarengaowa. Overview of Mongolian-language journals. Hohhot: Inner Mongolian
956 People's Press; 2014. p. 301-7. (in Mongolian)
- 957 32. Ge F, Tuan Y. Periodical publishing in Inner Mongolia. Inner Mongolia Culture Press;
958 1990. p. 425-7. (in Chinese)
- 959 33. Siqin, Nairisig, Wurchaih, Khasbagan. Study on the column setup of the
960 Mongolian-language magazine Science (1980-2020). J Inner Mongolia Normal Univ
961 (Nat Sci Mongol Ed). 2025:44-52. doi:10.3969/j.issn.1007-1105.2025.04.007. (in
962 Mongolian)
- 963 34. Nettle D, Romaine S. Vanishing voices: the extinction of the world's languages. Oxford:
964 Oxford University Press; 2000.
- 965 35. International Society of Ethnobiology. International Society of Ethnobiology Code of
966 Ethics (with 2008 additions). 2006. <https://www.ethnobiology.net/code-of-ethics/>.
967 Accessed 5 Aug 2026.
- 968 36. American Anthropological Association. Principles of Professional Responsibility. 2012.

- 969 <https://ethics.americananthro.org/ethics-statement-0-preamble/>. Accessed 5 Aug 2026.
- 970 37. Song KY, Zhang XD, Liu YC, Long B, Long CL. Beyond wrapping leaves: an
971 ethnobiological study on tangible culture of zongzi in China. *J Ethnobiol Ethnomed*.
972 2026;22:85. doi:10.1186/s13002-026-00954-w.
- 973 38. Zhao YZ, Zhao LQ, Cao R. Flora of Inner Mongolia. 3rd ed. Vol. 1-6. Hohhot: Inner
974 Mongolia People's Publishing House; 2020. (in Chinese)
- 975 39. Editorial Committee of Flora of China, Chinese Academy of Sciences. *Flora Reipublicae*
976 *Popularis Sinicae*. Vol. 35(2). Beijing: Science Press; 1979. (in Chinese)
- 977 40. Editorial Committee of Flora of China, Chinese Academy of Sciences. *Flora Reipublicae*
978 *Popularis Sinicae*. Vol. 22. Beijing: Science Press; 1998. (in Chinese)
- 979 41. Editorial Committee of Flora of China, Chinese Academy of Sciences. *Flora Reipublicae*
980 *Popularis Sinicae*. Vol. 49(2). Beijing: Science Press; 1984. (in Chinese)
- 981 42. Khasbagan. Manual of names of seed plants in Inner Mongolia. Hohhot: Inner Mongolia
982 Education Press; 2010. (in Chinese)
- 983 43. Wendusu. Mongolian–Chinese–Latin names of seed plants. Revised ed. Hohhot: Inner
984 Mongolian People's Press; 2016. (in Chinese)
- 985 44. Khasbagan. Folk tea plants of the Mongols. *Life World*. 1989;22-3. (in Chinese)
- 986 45. Khasbagan, Soyolt. A preliminary study on plants used as Mongolian traditional tea. *Acta*
987 *Bot Yunnanica*. 1990;12:43-8. (in Chinese)
- 988 46. Chen S. Study of tea plants used by Mongolians in the Mongolian Plateau and adjacent
989 regions. In: Abstracts of the 70th Annual Meeting of the Botanical Society of China
990 (1933-2003). Higher Education Press; 2003. p. 470-1. (in Chinese)

- 991 47. Khasbagan, Soyolt, Yinzabu. Ethnobotanical study of folk tea plants of Mongolians in Ar
992 Horqin Banner, Inner Mongolia. J Inner Mongolia Normal Univ (Nat Sci Ed). 1996:62-5.
993 (in Chinese)
- 994 48. Editorial Committee of Zhonghua Bencao, Administration of Traditional Chinese
995 Medicine. Chinese materia medica: Mongolian medicine volume. Shanghai: Shanghai
996 Science and Technology Press; 2004. p. 334-5. (in Chinese)
- 997 49. Zhanbuladaoerji. Canon of Mongolian medicine. Hohhot: Inner Mongolia Science and
998 Technology Press; 2015. p. 105, 112, 261. (in Mongolian)
- 999 50. Wurentuya. Dictionary of Mongolian-Chinese terms in Mongolian medicine. Hohhot:
1000 Inner Mongolian People's Press; 2001. (in Chinese)
- 1001 51. Lobsang. Mongolian materia medica. Hohhot: Inner Mongolian People's Press; 2006. p.
1002 186-7. (in Mongolian)
- 1003 52. WFO Consortium. World Flora Online. 2026. <http://www.worldfloraonline.org>. Accessed
1004 15 Aug 2026.
- 1005 53. iPlant. Flora of China online. 2026. <http://www.iplant.cn/foc>. Accessed 15 Aug 2026.
- 1006 54. Writing Group of "Mongolian Orthographic Dictionary". Mongolian orthographic
1007 dictionary. 3rd ed. Hohhot: Inner Mongolian People's Press; 2019.
- 1008 55. Xin LJ, Wujisiguleng, Wurihan, Tang W, Wang A, Long CL. Investigation of folk
1009 medicinal plants used by the Mongolians in Hure Banner, Inner Mongolia. J Minzu Univ
1010 China (Nat Sci Ed). 2012;21(2):11-8. (in Chinese)
- 1011 56. Mulan. Comparison between wild plant resources used for Chinese medicine and for
1012 Mongolian medicine in Inner Mongolia [thesis]. Inner Mongolia Normal University;

- 1013 2007. (in Chinese)
- 1014 57. Nabuqi. A study of the flora of sandy area in Hure Banner and its ethnobotany [thesis].
- 1015 Inner Mongolia Normal University; 2006. (in Chinese)
- 1016 58. Wurchaih. Study on Mongol-ethnobotany in Chaganhad, Bairin Left Banner of Inner
- 1017 Mongolia [thesis]. Inner Mongolia Normal University; 2019. (in Chinese)
- 1018 59. Weilesu. Ethnobotanical studies on wild forage plants in Heshigten Banner of Inner
- 1019 Mongolia [thesis]. Inner Mongolia Normal University; 2015. (in Chinese)
- 1020 60. Baosarula. Ethnobotanical study on wild plants of *Allium* L. in Inner Mongolia [thesis].
- 1021 Hohhot: Inner Mongolia Normal University; 2007. (in Chinese)
- 1022 61. Bai X. Ethnobotanical studies on wild forage plants in New Barag Left Banner of Inner
- 1023 Mongolia [thesis]. Inner Mongolia Normal University; 2016. (in Chinese)
- 1024 62. Chaomurilige. Mongol-ethnobotanical study in Axihan, Ongniud Banner, Inner Mongolia
- 1025 [thesis]. Inner Mongolia Normal University; 2021. (in Chinese)
- 1026 63. Aoguganmuqier, Terigelesaihan, Soyolt, Khasbagan. Investigation and analysis of wild
- 1027 forage plant resource in nomadic grazing system of Arhorqin pastures—A case study of
- 1028 Hundleng Summer Base. Chin Wild Plant Resour. 2017;36(2):66-9, 84.
- 1029 doi:10.3969/j.issn.1006-9690.2017.02.016. (in Chinese)
- 1030 64. Zhang YY, Khasbagan. Ethnobotanical value of the book Range Management written by
- 1031 Prof. Wang Dong. J Inner Mongolia Normal Univ (Nat Sci Ed). 2016;45:840-8. (in
- 1032 Chinese)
- 1033 65. Honggeer. A study of the flora of low mountain and hilly area in Hure Banner and its
- 1034 ethnobotany [thesis]. Inner Mongolia Normal University; 2006. (in Chinese)

- 1035 66. Yeruhan. Study on traditional botanical knowledge of the Mongolians in typical steppe
1036 area of Xilingol, Inner Mongolia [thesis]. Inner Mongolia Normal University; 2009. (in
1037 Chinese)
- 1038 67. Hulun. Study on traditional botanical knowledge of the Mongolians in typical steppe area
1039 of Hulunbuir [thesis]. Inner Mongolia Normal University; 2012. (in Chinese)
- 1040 68. Erdemutu. Study on wild edible plants of the Mongolians in Ordos Plateau [thesis]. Inner
1041 Mongolia Normal University; 2007. (in Chinese)
- 1042 69. Khasbagan, Pei SJ. Ethnobotanical study on *Allium* L. in grassland of Inner Mongolia.
1043 Chin J Grassl. 1999;43-8. (in Chinese)
- 1044 70. Khasbagan, Yeruhan, Zhao H. Study on traditional knowledge of wild edible plants used
1045 by the Mongolians in Xilingol typical steppe area. Plant Divers Res. 2011;33:239-46.
1046 doi:10.3724/SP.J.1143.2011.10158. (in Chinese)
- 1047 71. Sachula, Geilebagan, Zhang YY, Zhao H, Khasbagan. Wild edible plants collected and
1048 consumed by the locals in Daqinggou, Inner Mongolia, China. J Ethnobiol Ethnomed.
1049 2020;16(1):60. doi:10.1186/s13002-020-00411-2.
- 1050 72. Terigelesaihan. Ethnoecology of Arhorchin Grassland Nomadic Grazing System in Inner
1051 Mongolia—A case study of Hundelen Summer Herding Place [thesis]. Inner Mongolia
1052 Normal University; 2017. (in Chinese)
- 1053 73. Sachula. Investigation and evaluation on the local knowledge of edible and medicinal
1054 wild plants in Daqinggou, Inner Mongolia [thesis]. Inner Mongolia Normal University;
1055 2020. (in Chinese)
- 1056 74. Khasbagan, Chen S, Mandula, Yinzab. Ethnobotanical study of the Mongolian use of

- 1057 *Artemisia frigida* Willd. J Inner Mongolia Normal Univ (Nat Sci Ed). 1994(2):59-65. (in
1058 Chinese)
- 1059 75. Yirugui. Study on the wild plants collected and medicinal used by the folk healers in
1060 Heshigten Banner of Inner Mongolia [thesis]. Inner Mongolia Normal University; 2017.
1061 (in Chinese)
- 1062 76. Yirugui, Zhang W, Ren X, Zhao L. Biodiversity, sustainable utilization, and conservation
1063 of the wild plants used in Traditional Mongolian Medicine of the Greater Khingan
1064 Mountains. J Ethnobiol Ethnomed. 2025;21:71. doi:10.1186/s13002-025-00802-3.
- 1065 77. Huar. Study on traditional botanical knowledge of the Mongolians of Bairin Right Banner
1066 in Inner Mongolia [thesis]. Inner Mongolia Normal University; 2011. (in Chinese)
- 1067 78. Mandakh U, Battseren M, Ganbat D, Ayanga T, Adiya Z, Borjigidai A, et al. Folk
1068 nomenclature of plants in *Cistanche deserticola*-associated community in South Gobi,
1069 Mongolia. Plant Divers. 2020;42(6):434-42. doi:10.1016/j.pld.2020.09.008.
- 1070 79. Tie L. The preliminary investigation of wild plant resources in Kubuqi Desert [thesis].
1071 Inner Mongolia Normal University; 2015. (in Chinese)
- 1072 80. Jin L, Zhang S, Cheng W, Khasbagan. The research of wild plant diversity used by the
1073 Mongolian in the Modood Soom of Horqin Left Wing Rear Banner. J Inner Mongolia
1074 Minzu Univ (Nat Sci Ed). 2014;29(4):436-42. doi:10.14045/j.cnki.15-1220.2014.04.058.
1075 (in Chinese)
- 1076 81. Khasbagan, Soyolt. Indigenous knowledge for plant species diversity: a case study of
1077 wild plants' folk names used by the Mongolians in Ejina desert area, Inner Mongolia, PR
1078 China. J Ethnobiol Ethnomed. 2008;4:2. doi:10.1186/1746-4269-4-2.

- 1079 82. Khasbagan, Soyolt, Manliang, Enhebayer, Gerelt, Hu Wu-ren. Traditional usage of wild
1080 plants for food by the Ejina Mongolians and its exploitation and ethnoecological
1081 significance. J Inner Mongolia Normal Univ (Nat Sci Ed). 2005(4):471-4, 488. (in
1082 Chinese)
- 1083 83. Huwuren. Ethnobotanical studies on wild plant resources of Ejina [thesis]. Inner
1084 Mongolia Normal University; 2005. (in Chinese)
- 1085 84. Gegentana. Study on traditional botanical knowledge of the Mongols in Horqin Left
1086 Wing Rear Banner of Inner Mongolia [thesis]. Inner Mongolia Normal University; 2008.
1087 (in Chinese)
- 1088 85. Khasbagan. Study on wild edible plants in The Secret History of the Mongols. J Arid
1089 Land Resour Environ. 1996(1):87-94. doi:10.13448/j.cnki.jalre.1996.01.014. (in
1090 Chinese)
- 1091 86. Qian D, Duoliya. Traditional usage of wild plants for food by the Zhelimu Mongolians
1092 and its exploitation and ethnoecological significance. Chin J Ethnomed Ethnopharm.
1093 2012;21(10):2-4. (in Chinese)
- 1094 87. Bayindala, Garisang Aolibu, Khasbagan. Studies on medical ethnobotany of the Olot
1095 Mongolians in Xinjiang, China. Chin J Ethnomed Ethnopharm. 2010;19(3):1-4. (in
1096 Chinese)
- 1097 88. Wujisiguleng, Khasbagan, Long CL. Analysis of folk knowledge of plants used for
1098 treatment of rheumatism in the eastern Inner Mongolian communities. J Inner Mongolia
1099 Normal Univ (Nat Sci Ed). 2011;40(4):398-403. (in Chinese)
- 1100 89. Yirugui, Khasbagan. Preliminary investigation on the medicinal wild plants used by folk

- 1101 healers in Heshigten Banner of Inner Mongolia. J Li-shizhen Trad Chin Med.
 1102 2017;28(5):1204-6. doi:10.3969/j.issn.1008-0805.2017.05.068. (in Chinese)
- 1103 90. Menggenqiqig, Khasbagan. A preliminary investigation on the wild plants used as
 1104 medicine by the Mongolian folk healers in Bairin Right Banner, Inner Mongolia. J
 1105 Li-shizhen Trad Chin Med. 2012;23(3):744-7. doi:10.3969/j.issn.1008-0805.2012.03.106.
 1106 (in Chinese)
- 1107 91. Burie. Ethnobotany of Jirem grassland vegetation zone of Mongolia folk use of medicinal
 1108 plant resources and cultural characteristics of pharmacy. J Med Pharm Chin Minorities.
 1109 2014;20(8):48-52. doi:10.16041/j.cnki.cn15-1175.2014.08.060. (in Chinese)
- 1110 92. Li Zhaorigertu, Sarangerile. Preliminary survey of folk medicinal plants of Mongolians in
 1111 Jarud Banner, Inner Mongolia. China J Chin Mater Med. 2012;37(21):3321-2. (in
 1112 Chinese)
- 1113 93. Liu GX. A collation and study on biological species and their related local knowledge in P.
 1114 K. Kozlov's expedition note "Mongolia and Amdo and the Dead City of Khara-Khoto".
 1115 Inner Mongolia Normal University; 2021. (in Chinese)
- 1116 94. Chaolumen, Huar, Khasbagan. Study on the wild ornamental plants resources in Asihatu
 1117 Stone Forest Scenic Spot. J Inner Mongolia Normal Univ (Nat Sci Ed). 2011;40(3):291-6,
 1118 302. (in Chinese)
- 1119 95. Wurchaih, Gao WW, Zhang YY. Yunatov and his forage plants for grazing and mowing
 1120 fields in the People's Republic of Mongolia. J Inner Mongolia Normal Univ (Nat Sci Ed).
 1121 2023;52(5):463-8. doi:10.3969/j.issn.1001-8735.2023.05.004. (in Chinese)
- 1122 96. Khasbagan, Soyolt, Geng XH, Orgil, Jin F, Chen S. Nutritional contents of the fruits of

- 1123 *Ribes diacanthum* Pall. and its evaluation of edible value. J Inner Mongolia Normal Univ
1124 (Nat Sci Ed). 2007;(4):477-9, 483. (in Chinese)
- 1125 97. Jin L. Study on plants in homegardens of the Mongolians in Horqin Sandy Land—a case
1126 study in Horqin Left Wing Rear Banner, Tongliao, Inner Mongolia [thesis]. Inner
1127 Mongolia Normal University; 2008. (in Chinese)
- 1128 98. Cao Wujisiguleng. The wild vegetable resources in Inner Mongolia and its integrated
1129 assessment [thesis]. Inner Mongolia Normal University; 2008. (in Chinese)
- 1130 99. Jiang CY, Tie L, Khasbagan, Gegentana. Preliminary investigation on the wild plants
1131 used for Mongolia medicine in Kubuqi Desert, Inner Mongolia. Chin Wild Plant Resour.
1132 2015;34(3):65-8. (in Chinese)
- 1133 100. Khasbagan, Pei SJ. Wild plants used for the folk dietotherapy Arhorchin Mongolians. J
1134 Chin Med Mater. 2001;(2):83-5. doi:10.13863/j.issn1001-4454.2001.02.003. (in
1135 Chinese)
- 1136 101. Cantwell-Jones A, Ball J, Collar D, Diazgranados M, Douglas R, Forest F, et al. Global
1137 plant diversity as a reservoir of micronutrients for humanity. Nat Plants.
1138 2022;8(3):225-32. doi:10.1038/s41477-022-01100-6.
- 1139 102. Menghenaren, Gao SX. Brief analysis of breeding technology and development of
1140 Ujumqin sheep. Farmers' Friend for Prosperity. 2016;(4):279, 217. (in Chinese)
- 1141 103. Yin Z. Historical Romance of the Blue Chronicle. Vol. 1. Heile, Ding S, translators.
1142 Hohhot: Inner Mongolian People's Press; 1985. p. 7-8. (in Chinese)
- 1143 104. Sun SM. Collated and annotated edition of Essential Prescriptions Worth a Thousand
1144 Gold for Emergencies (Beiji Qianjin Yaofang, Tang Dynasty). Li JR, annotators. Beijing:

- 1145 People's Medical Publishing House; 1998. p. 110-1. (in Chinese)
- 1146 105. Chen JL, Zhang HZ, Li MK, Li ZY, Qin XM. Inheritance and modern research progress
1147 of traditional Chinese medicine honey pills. Drug Eval Res. 2026;49(7):2584-97.
1148 doi:10.7501/j.issn.1674-6376.2026.07.029. (in Chinese)
- 1149 106. National Forestry and Grassland Administration. The *Tamarix chinensis* mentioned in the
1150 Book of Songs and Er Ya. 2024.
1151 <https://www.forestry.gov.cn/c/www/hmjyjl/547513.jhtml>. Accessed 11 Aug 2026.
- 1152 107. Li WL, Zhang Q, Fan YX, Cheng Z, Lu XP, Luo BS, et al. Traditional management of
1153 ancient Pu'er tea gardens in Jingmai Mountains in Yunnan of China, a designated
1154 Globally Important Agricultural Heritage Systems site. J Ethnobiol Ethnomed.
1155 2023;19(1):26. doi:10.1186/s13002-023-00598-0.
- 1156 108. Wang YQ. Development of ethnobotany in Inner Mongolia [thesis]. Hohhot: Inner
1157 Mongolia Normal University; 2011. (in Chinese)
- 1158 109. Pieroni A, Hazarika A, Alrhoun M, Yebouk C, Dina E, Manduzai AK, et al. From the
1159 margins to the core: village and community scientists should increasingly shape the
1160 future of ethnobiology and ethnoecology. J Ethnobiol Ethnomed. 2026;22(1):81.
1161 doi:10.1186/s13002-026-00941-1.
- 1162 110. Aguirre AA. Biodiversity and human health. EcoHealth. 2009;6(2):153-6.
1163 doi:10.1007/s10393-009-0250-9.
- 1164 111. Mistry J, Berardi A. Bridging indigenous and scientific knowledge. Science.
1165 2016;352(6291):1274-5.
- 1166 112. Seele BC, Dreyer L, Esler KJ, Cunningham AB. The loneliness of the long-distance

1167 ethnobotanist: a constructive critique of methods used in an ethnoveterinary study in
 1168 Mongolia. J Ethnobiol Ethnomed. 2021;17(1):66. doi:10.1186/s13002-021-00492-7.

1169 113. Cox PA, Balick MJ. The ethnobotanical approach to drug discovery. Sci Am.
 1170 1994;270(6):82-7. doi:10.1038/scientificamerican0694-82.

1171 114. Barwin L, Shawande M, Crighton E, Veronis L. Methods-in-place: "Art Voice" as a
 1172 locally and culturally relevant method to study traditional medicine programs in
 1173 Manitoulin Island, Ontario, Canada. Int J Qual Methods. 2015;14(5):1-11.
 1174 doi:10.1177/1609406915611527.

1175 115. Agrawal A. Dismantling the divide between indigenous and scientific knowledge. Dev
 1176 Change. 1995;26(3):413-39. doi:10.1111/j.1467-7660.1995.tb00560.x.

1177 116. Nona F, Wigginton B. ArtVoice: an Indigenous-informed visual arts-based method for
 1178 exploring knowledges on Country in Zenadth Kes. Int J Qual Methods. 2025;24:1-9.
 1179 doi:10.1177/16094069251404335.

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1181 **Figure 1** Archival and bibliographical artifacts of the inaugural issue of *Sinjilex Uxagan*. (a)
 1182 Front cover; (b) Back cover; (c) Table of contents in traditional Mongolian script; (d)
 1183 Opening text in lieu of an inaugural editorial

1184 **Figure 2** Annual distribution trend of TBK-related articles on TBK published in SLX
 1185 (1980-2020)

1186 **Figure 3** Multidimensional characteristic analysis of traditional utilized plants recorded in
 1187 SLX: (a) Family-level distribution; (b) Classification of utilized plant parts; (c) Classification
 1188 of traditional uses

1189 **Figure 4** Traditional edible and food-medicine homology plants

1190 **Figure 5** Classification of edible plants recorded in SLX

1191 **Table 4** Inventory of plant species recorded in SLX

Scientific name	Local Names ¹⁾	Mongolian	Used Parts ²⁾	Use categories	Utilization	Comparison with previous ethnobotanical studies ³⁾	Ref. Code ⁴⁾
<i>Aconitum kusnezoffii</i> Rchb.	ᠪᠣᠨᠠ [bɔŋ a] ᠳᠵᠢᠮᠪᠠ [dzimba]		TR	Veterinary Medicine/Human Medicine	Decocted in water, cooled to lukewarm, and applied topically to wolf-bite wounds on horses; dispelling wind, eliminating dampness, warming meridians, and alleviating pain.	+(D): PR only for human medicinal use [55]	19900304; 20070513
<i>Acorus calamus</i> L.	ᠳᠵᠠᠭᠰ [dʒəgs] ᠣᠮᠬᠢᠯᠠᠳᠵᠠᠭᠰ [omxil dʒəgs]		Le/In/Rh	Material/Veterinary Medicine	Leaves: woven into door curtains, kang mats, pot lids, and insect-repellent grain containers; Spadices: used to stuff bedding and cushions; Rhizomes: used to treat livestock dyspepsia.	+(D): PR for medicinal use and congeneric species for daily materials [56,57]; no veterinary records.	19930211; 19970510
<i>Agropyron cristatum</i> (L.) Gaertn.	ᠵᠣᠷᠶᠣᠭ [jɔrxɔg]		AP	Fodder	Promoting "water-fat" accumulation in sheep	+(R): Consistent forage use [58]; PR also for religious purpose as Buddhist altar lamp wicks [59]	19820606
<i>Allium anisopodium</i> Ledeb.	ᠶᠡᠭᠣᠪᠠᠨᠬᠤᠯ [jɔwɔ:n xul]		AP	Fodder	Promoting "water-fat" accumulation in sheep	+: [60, 61]	19820606
<i>Allium</i> sp.	ᠬᠡᠭᠠᠷᠠᠨᠰᠣᠩᠭᠢᠨ [xəgərə in sɔŋgin]		AP	Edible	Specific use not specified	+(R): PR species of this genus for vegetable and forage uses [62, 63]	20080311
<i>Allium</i> sp.	ᠭᠠᠭᠤᠭᠣᠳ [gəgɔd]		AP/NS	Fodder/Edible	Summer forage for sheep fattening; specific preparation not specified	+(R): PR of this genus for forage and vegetable uses, with multiple culinary methods documented [62, 63, 64].	19820505; 20100617; 20080311
<i>Allium macrostemon</i> Bunge	ᠰᠡᠩᠭᠠᠰ [səŋgəs]		NS	Edible	Consumption method not specified	+(R): PR, in addition to edible use, documented medicinal and forage uses, as well as folk taboos and contents with religious connotations [60, 65].	20080311
<i>Allium mongolicum</i> Regel	ᠬᠣᠮᠡᠯᠢ [xoməli]		AP	Fodder (toxic in excess)	High-quality summer fattening forage; camel toxicosis from overingestion is treated via oral drenching with fatty broth, cold mud compresses, and phlebotomy.	+(E): PR for forage, food, medicine, and livestock overconsumption poisoning [66, 67,68]; this magazine newly recorded treatment methods for overconsumption.	19820505; 19970204; 19900412
<i>Allium polyrhizum</i> Turcz. ex Regel	ᠲᠠᠨ [ta:n]		AP	Fodder (toxic in excess) /Vegetable/Human Medicine	High-quality summer fattening forage; camel toxicosis from overingestion is treated via oral drenching with fatty broth, cold mud compresses, and phlebotomy; pickled for dietary consumption; stomachic (invigorating stomach function).	+(E):PR for forage, livestock overconsumption poisoning, medicine, and food [69, 70]; this magazine newly recorded treatment methods for overconsumption.	19820505; 19820606; 19970204; 19900412; 20080311; 20100617
<i>Allium senescens</i> L.	ᠮᠠᠭᠭᠢᠷ [mæŋgir]		AP/NS	Fodder/Edible	Autumn forage promoting sheep fattening; consumption method not specified.	+(R): PR for edible, forage, and medicinal uses [69, 70].	19820505; 19820606; 20080311; 20100617
<i>Allium victorialis</i> L.	ᠬᠠᠡᠯᠠᠭ [xælær]		Le	Veterinary Medicine	Treating metabolic disorders in the five livestock species.	+(D): PR for edible and forage uses [11, 69].	19980322
<i>Amaranthus retroflexus</i> L.	ᠠᠷᠠᠠᠢ [arwai]		Le/Se	Vegetable/Grain substitute	Leaves decocted and mixed with milk and clotted cream (orom) for consumption; fruits harvested in autumn as staple food substitutes.	+: [71]	20100617
<i>Angelica sinensis</i> (Oliv.) Diels	ᠳᠠᠩᠭᠤᠨ [daŋgun]		Ro	Human Medicine	Equal parts of <i>Cervi Cornu Pantotrichum</i> and <i>Angelicae Sinensis Radix</i> pulverized, kneaded with <i>Prunus mume</i> fruit juice into pills the size of <i>Firmiana simplex</i> seeds; orally administered at 50 pills daily on an empty* stomach; treating dull complexion, tinnitus, deafness, xerostomia, and lumbocrural pain.		20120609

Scientific name	Local Names ¹⁾	Mongolian	Used Parts ²⁾	Use categories	Utilization	Comparison with previous ethnobotanical studies ³⁾	Ref. Code ⁴⁾
<i>Artemisia anethoides</i> Mattf.	ᠪᠣᠳᠵᠢᠮᠤᠭ [bōdʒmāg]		AP	Fodder	Autumn grazing promoting rapid solid-fat accumulation (Zhua You Biao) in sheep.	+; [72]	19820505; 19820606
<i>Artemisia brachyloba</i> Franch.	ᠪᠣᠳᠣᠷᠭᠠᠨ [bōdurgan]		AP	Fodder	Autumn forage promoting sheep fattening, highly palatable to camels.	+(R): PR for forage value and medicinal value [72, 17].	19820505
<i>Artemisia frigida</i> Willd.	ᠭᠡᠭᠢ [ægi]		AP	Fodder	Summer grazing promotes sheep fattening, while autumn grazing induces solid-fat accumulation (Zhua You Biao).	+(R): PR documented forage, edible, cultural, and medicinal values [17, 73, 74].	19820505; 19820606; 19970204
<i>Artemisia</i> sp.	ᠶᠢᠷᠠᠯᠳᠤ [jīraldʒ]		In	Human Medicine	<i>Artemisia</i> spp. inflorescences (4 liang) and Glycyrrhizae Radix et Rhizoma (4 qian) decocted for oral administration to treat furuncles and wounds.	+(D): PR of this genus for treating other diseases [65, 75].	19840122
<i>Artemisia scoparia</i> Waldst. et Kit.	ᠶᠢᠷᠠᠯᠳᠤ [lma:n jīraldʒ]		AP	Fodder	Autumn forage promoting sheep fattening.	+: [72]	19820505
<i>Astragalus mongholicus</i> Bunge	ᠬᠣᠨᠲᠤᠯᠠᠷ [xōntʃlɿr]		Ro	Veterinary Medicine	Treating metabolic disorders in the five livestock species.	+(D): PR for human medicinal use [76].	19980322
<i>Basella alba</i> L.	ᠬᠤᠯᠠᠨ ᠬᠠᠯᠤᠮ [ula:n xalom]		Le	Vegetable/Human Medicine	Consumed as vegetable; treating alternating chills and fever, promoting diuresis, and stimulating galactopoiesis (galactagogue).	*	20040127
<i>Berberis amurensis</i> Rupr.	ᠲᠣᠮ ᠣᠷᠭᠣᠰᠤᠲᠤ ᠶᠠᠷ ᠮᠣᠳᠤ [tōm orgo:st ʃar mōd]		St/Ro	Human Medicine	Eliminating yellow fluid (Shar-us), astringing toxins, antidiarrheal, antipyretic, hemostatic, and improving visual acuity.	*	19940204
<i>Berberis caroli</i> C.K.Schneid.	ᠣᠷᠳᠠᠰ ᠣᠷᠭᠣᠰᠤᠲᠤ ᠶᠠᠷ ᠮᠣᠳᠤ [ordas in orgo:st ʃar mōd]		St/Ro	Human Medicine	Eliminating yellow fluid (Shar-us), astringing toxins, antidiarrheal, antipyretic, hemostatic, and improving visual acuity.	+(D): PR for edible plant use [68, 77]	19940204
<i>Berberis sibirica</i> Pall.	ᠣᠷᠭᠣᠰᠤᠲᠤ ᠶᠠᠷ ᠮᠣᠳᠤ [jībɛ:r in orgo:st ʃar mōd]		St/Ro	Human Medicine	Eliminating yellow fluid (Shar-us), astringing toxins, antidiarrheal, antipyretic, hemostatic, and improving visual acuity.	*	19940204
<i>Bidens tripartita</i> subsp. <i>bullata</i> (L.) Rouy	ᠭᠣᠷᠪᠠᠰᠠᠨ ᠬᠠᠷᠠᠤᠲᠤ [gōrbawsan xarwa:tʃ ows]		AP	Veterinary Medicine	Harvested before or during flowering; treating gastrointestinal disorders in livestock.	*	19970510
<i>Bistorta officinalis</i> Raf.	ᠬᠠᠶᠢᠮ [uxəɾ mæxə:r]		Rh	Veterinary Medicine	Treating gastrointestinal disorders in livestock.	+(D): PR for human medicinal use [76]	19970418
<i>Brassica juncea</i> (L.) Czern.	ᠭᠠᠶᠢᠮ [gaim]		Se	Veterinary Medicine	Treating respiratory disorders in the five livestock species.	*	19980214
<i>Cancrinia discoidea</i> (Ledeb.) Poljak. ex Tzvel.	ᠮᠣᠷᠢᠨ ᠭᠡᠭᠢ [mōrin ægi]		AP	Fodder	Spring forage promoting sheep fattening.	*	19820505
<i>Cannabis sativa</i> L. f. <i>ruderalis</i> (Janisch.) Chu	ᠳᠵᠠᠷᠯᠢᠭ ᠣᠯᠰ [dʒɜrlig ɔls]		St/Se	Material/Edible oil/Industrial	Stems harvested in autumn for cordage; seeds pressed for industrial and edible oils.	+(R): PR also documented human medicinal and ethnoveterinary values [62].	20100617
<i>Caragana</i> sp.	ᠬᠠᠷᠭᠠᠨᠠ [xargana]		St/Le	Fodder	Highly palatable to camels.	+: [78]	19820505
<i>Caragana</i> sp.	ᠠᠯᠲᠠᠭᠠᠨᠠ [altagana]		WP/St/Le/FI/Se	Ecological/Industrial/Fodder	Sand fixation; stem bast fibers used for papermaking and artificial fiber processing; seeds pressed for oil; young stems, leaves, and flowers used as forage.	+: [57, 62, 79]	19940228

Scientific name	Local Names ¹⁾	Mongolian	Used Parts ²⁾	Use categories	Utilization	Comparison with previous ethnobotanical studies ³⁾	Ref. Code ⁴⁾
<i>Caragana</i> sp.	ᠬᠠᠷᠠᠭᠠᠨᠠ [xargana]		St/Le	Fodder (toxic excess)	Ingestion during cold and rainy weather induces ruminal tympany (bloat) in camels; symptoms are relieved via the oral administration of fermented mare* milk (airag) or strong distilled liquor.		19900412
<i>Caragana leucophloea</i> Pojark.	ᠠᠯᠲᠠᠨ ᠬᠠᠷᠠᠭᠠᠨᠠ [altan xargana]		St/Le	Fodder	Spring forage	+: [61]	19820505
<i>Caragana stenophylla</i> Pojark.	ᠨᠠᠷᠢᠨ ᠬᠠᠷᠠᠭᠠᠨᠠ [nari:n xargana]		St/Le	Fodder	Spring forage	+: [58]	19820505
<i>Carthamus tinctorius</i> L.	ᠭᠤᠷᠭᠣᠮ [gurgom]		Fl	Veterinary Medicine	Fumigation with red sandalwood and safflower to treat equine cold colic.	+(E): Medicinal use; this magazine provides more detailed records than PR [80].	19850346
<i>Caroxylon passerinum</i> (Bunge) Akhani et Roalson	ᠪᠣᠷ ᠪᠣᠳᠦᠷᠭᠠᠨᠠ [bør bødurgan]		St/Le	Fodder	Summer forage promoting sheep fattening	+: [81]	19820505
<i>Chenopodium album</i> L.	ᠨᠠᠶᠢᠯ [nail]		Le	Edible	No specific utilization method reported.	+: [71]	20080311
<i>Chenopodium hybridum</i> L.	ᠮᠣᠷᠢᠨ ᠨᠠᠶᠢᠯ [morin nail]		Le/St/Se	Vegetable/Beverage/Edible oil/Condiment/Fodder	Leaves blanched, kneaded in cold water, and simmered with dairy products until pale yellowish for consumption; used in liquor brewing, oil pressing,* and paste preparation. Stems, leaves, and seeds boiled with whey (sirasu) as swine feed.		19940228
<i>Chenopodium stenophyllum</i> (Makino) Koidz.	ᠬᠥᠨᠠᠶᠢᠯ ᠨᠠᠶᠢᠯ [xonin nail]		Le/St/Se	Vegetable/Beverage/Edible oil/Condiment/Fodder	Leaves blanched, kneaded in cold water, and simmered with dairy products until pale yellowish for consumption; used in liquor brewing, oil pressing,* and paste preparation. Stems, leaves, and seeds boiled with whey (sirasu) as swine feed.		19940228
<i>Cistanche deserticola</i> Ma	ᠲᠢᠶᠠᠭᠠᠨ ᠭᠣᠵᠤ [tfaga:n goju:]		WP	Veterinary Medicine	Treating gastrointestinal inflammation in juvenile livestock.	+(R): PR also for human medicinal use [78, 82].	19970618
<i>Corylus heterophylla</i> Fisch. ex Trautv.	ᠶᠢᠳ [jid]		Fr/Se	Wild fruit/Edible oil	Fruits harvested in autumn, fermented in closed containers for 2–3 days, and consumed after peeling; seeds pressed for oil.	+(E): PR documented edible fruits [71]; extracting seed oil is a newly recorded use.	19940525
<i>Corispermum squarrosum</i> L.	ᠲᠦᠯᠭᠢᠷ [tfolgir]		Se/AP	Grain substitute/Fodder	Seeds ground into flour for consumption; forage highly palatable to camels.	+: [11, 70, 83]	20100617

Scientific name	Local Names ¹⁾	Mongolian	Used Parts ²⁾	Use categories	Utilization	Comparison with previous ethnobotanical studies ³⁾	Ref. Code ⁴⁾
<i>Crataegus pinnatifida</i> Bunge	ᠳᠣᠯᠤᠨ [dolo:n]		Ro/Fr/Tk/Le/St	Wild fruit/Human Medicine/Veterinary Medicine/Material/Cultural	Fruits consumed as food, invigorate the spleen, promote digestion, relieve cough, and arrest diarrhea; roots treat arthritis and edema. Tender stem infusion lowers blood pressure. Root decoction treats lamb diarrhea, tetanus, and gastroenteritis and edema in large livestock. Dried leaves fed to pregnant dams to prevent miscarriage, and fed to swine to aid digestion and promote fattening. Branches used to craft yurt roof rings (toono) and utensils; hawthorn wood traditionally selected for newlyweds' yurt roof rings. Firm root systems symbolize auspiciousness and stability; abundant fruits symbolize fertility and prosperity.	+(E): Ethnoveterinary and cultural uses are newly recorded; other uses are consistent with PR [73, 84, 85]	19970534; 20080311
<i>Cynanchum thesioides</i> (Freyn) K. Schum.	ᠭᠤᠰᠤᠨ ᠬᠡᠭᠦ [təmə:n xuxu]		Fr	Wild fruit	No specific utilization method reported.	+(R): PR, in addition to edible use, also documented medicinal use [57, 62]	20080311; 20100617
<i>Cynomorium songaricum</i> Rupr.	ᠤᠯᠠᠨ ᠭᠠᠵᠤ [ula:n gəjʊ:]		WP	Veterinary Medicine	Treating intestinal disorders in large livestock, alleviating gastrointestinal inflammation in juvenile livestock, and arresting diarrhea.	+(D): PR documented soaking in liquor for health promotion [82] and soaking in goat milk for consumption to treat gastrointestinal diseases [83]	19970510
<i>Dioscorea polystachya</i> Turcz.	ᠨᠠᠭᠢ ᠲᠭᠠᠭᠠᠨ [næŋgi tʃaga:n]		Tu	Human Medicine	Dispelling wind and arresting vertigo, alleviating lumbago, and strengthening sinews and bones.	*	20040127
<i>Ephedra sinica</i> Stapf	ᠳᠵᠠᠭᠠᠷᠭᠠᠨ [dʒagərgənə]		AP/MC	Fodder (toxic excess) /Wild fruit	Ingestion of <i>Ephedra sinica</i> by camels in extreme cold environments frequently induces physiological impairment or systemic functional failure. Megasporangiate strobili (female cones) are edible.	+(E): Conditional grazing poisoning in camels is newly recorded; lacking human medicinal records found in prior studies [17].	19900412; 20100617
<i>Equisetum hyemale</i> L.	ᠣᠨᠢ ᠣᠰ [onis ows]		St	Vegetable	Stems harvested from March to April, blanched in boiling water, and soaked in fresh water overnight to eliminate off-odors before consumption the following day.	+(D): PR for forage and human medicinal uses [62,76]	19940525
<i>Eremogone juncea</i> (M.Bieb.) Fenzl	ᠳᠵᠢᠭᠠᠭᠠᠷᠭᠠᠨ [dʒɪfaggarbo]		WP	Veterinary Medicine	Plant ash applied to equine trauma; further details unspecified.	+(D): PR for human medicinal use [76].	19900304
<i>Fagopyrum esculentum</i> Moench.	ᠰᠠᠭᠠᠭ [sagag]		Fr	Grain/Human Medicine	Important local grain; manages dysentery, infantile erysipelas, headache, leukorrhea, and assists blood pressure regulation.	+: [73, 85, 86]	19910652
<i>Festuca ovina</i> L.	ᠪᠣᠳᠠᠭᠤᠯ [bodayul]		AP	Fodder	Promotes watery fat in sheep	+: [65]	19820606

Scientific name	Local Names ¹⁾	Mongolian	Used Parts ²⁾	Use categories	Utilization	Comparison with previous ethnobotanical studies ³⁾	Ref. Code ⁴⁾
<i>Firmiana simplex</i> (L.) W. Wight	ᠤᠵᠠᠭᠭᠠᠳᠤ ᠮᠣᠳᠤ [ujangat mod]		Se	Natural size reference	Deer antler and Chinese angelica root powdered in equal proportions, bound with plum juice into firmiana-seed-sized pills, and administered orally (50 pills daily on an empty stomach). Used to treat dull complexion, tinnitus, deafness, dry mouth, and lower back and leg pain.	*	20120609
<i>Geranium pratense</i> L.	ᠲᠠᠯᠠ ᠶᠢᠨ ᠵᠢᠮᠳᠠᠭᠯᠠᠢ [tala in jimdäglai]		AP	Veterinary Medicine	Treating gastrointestinal disorders in livestock.	+(D): PR for human medicinal use [75, 87].	19970418
<i>Glycyrrhiza uralensis</i> Fisch. ex DC.	ᠶᠢ᠋ᠶᠢᠷ ᠣᠠᠰ [jixir ows]		Ro	Veterinary Medicine	Treating respiratory disorders in the five livestock species.	+(R): PR, in addition to ethnoveterinary use [77], also documented human medicinal use [62, 87]	19980110
<i>Helictotrichon hookeri</i> (Scribn.) Romero Zarco	ᠪᠣᠷᠠᠭ [börög]		AP	Fodder	Promotes watery fat in sheep	*	19820606
<i>Hemerocallis citrina</i> Baroni	ᠶᠠᠷ ᠲᠥᠳᠥᠭ [jar tɛtɕəḡ] ᠶᠠᠷ ᠬᠣᠠᠷ [jar xoar]		Fl	Edible	No specific consumption method reported	+: [62, 70]	20080311; 20100617
<i>Hippophae rhamnoides</i> L.	ᠲᠢᠶᠢᠳᠠᠭᠠᠨ [tɕitʃargana]		Fr	Veterinary Medicine	Treats metabolic diseases in the five livestock species.	+(D): PR for human medicine and excellent forage [79, 87]	19980322
<i>Hordeum vulgare</i> L.	ᠠᠷᠠᠢ [arwai]		WP	Veterinary Medicine	Whole-plant decoction mixed with meat broth and administered orally to camels to relieve fatigue caused by long-distance draft labor.	*	19900412
<i>Hyoscyamus niger</i> L.	ᠲᠠᠨᠠᠭ ᠣᠠᠰ [tənəḡ ows]		Le/Fr	Veterinary Medicine	Treating gastrointestinal disorders in livestock.	+(D): PR as a human medicinal plant for treating digestive tract diseases [76]	19970618
<i>Imperata cylindrica</i> (L.) P. Raeusch.	ᠤᠯᠠᠯᠳᠵᠢ [ulaldzi]		Rh/Le/In/St	Sugar source/Beverage/Fodder/Material	Rhizomes used for sugar extraction and alcohol brewing; leaves used as forage; inflorescences (down/fluff) used as a cotton substitute; stems and leaves used for yurt insulation/packing, weaving parasols, and as fuelwood.	*	19940228
<i>Inula japonica</i> Thunb.	ᠠᠯᠲᠠᠨ ᠲᠥᠳᠥᠭ [altan dɔsl tɕtɕəḡ]		WP/Fl	Veterinary Medicine	Treating respiratory disorders in five livestock species.	+(D): PR as a human medicinal plant for treating respiratory tract diseases [75]	19980110
<i>Juncus</i> sp.	ᠭᠣᠯ ᠣᠠᠰ [gol ows]		WP	Human Medicine	Topical application (10 consecutive doses) treats body ringworm.	*	19840122
<i>Leonurus japonicus</i> Houtt.	ᠳᠠᠷᠠᠭᠠᠳᠤ ᠣᠠᠰ [durwəldɜ ows]		NS	Human Medicine	Artemisia spp. inflorescences (4 liang) and Glycyrrhizae Radix et Rhizoma (4 qian) decocted for oral administration to treat furuncles and wounds.	+(R): PR also for treating gynecological diseases and rheumatism [73, 88]	19840122
<i>Leontopodium leontopodioides</i> (Willd.) Beauv.	ᠤᠯ ᠣᠠᠰ [ul ows]		NS	Human Medicine	Used as adjunctive incense or moxa wool in convalescent physiotherapy following traditional Mongolian concussion-resetting manipulation.	+(D): PR focused on respiratory or urinary tract diseases [56, 58, 75]	19830408
<i>Lepidium apetalum</i> Willd.	ᠢᠨ ᠰᠠᠵᠤ ᠣᠠᠰ [in sɔɜ: ows]		Se	Veterinary Medicine	Treating respiratory disorders in the five livestock species.	+(D): PR as a human medicinal plant for treating respiratory tract diseases [65, 89]	19980110
<i>Lеспедеза даврика</i> (Laxm.) Schindl.	ᠬᠡᠷᠪᠠᠭᠢ [xurbəḡə]		Le	Tea substitute	Leaves harvested in autumn and decocted as a tea substitute for daily drinking.	+: [45, 65]	20100617
<i>Leymus chinensis</i> (Trin.) Tzvelev	ᠬᠢᠵᠠᠭ [xijag]		WP	Fodder/Veterinary Medicine	Forage to enhance gastrointestinal health in horses	+(E): PR only documented as a high-quality forage plant [58, 59]; ethnoveterinary use is newly recorded.	19880553; 19820606
<i>Lilium pumilum</i> Redoute	ᠰᠠᠷᠠᠨᠠ [sarna:]		Bu/Fl	Cultural/Beverage/Orn	Flowers used for ornamental purposes; bulbs utilized for alcohol brewing	+(R): PR also for bulbs as a grain substitute [85]	19800102

Scientific name	Local Names ¹⁾	Mongolian	Used Parts ²⁾	Use categories	Utilization	Comparison with previous ethnobotanical studies ³⁾	Ref. Code ⁴⁾
				amental/Human Medicine	and medicinal use; frequently featured in literary works.		
<i>Malus baccata</i> (L.) Borkh.	ᠮᠠᠯᠤᠰᠤᠨ [uril] ᠮᠠᠯᠤᠰᠤᠨ [urəl]		Fr/St/Ro/Tk/Le	Wild fruit/Human Medicine/Material/Cultural/Tea substitute/Fodder/Veterinary Medicine	Fruits consumed raw to aid digestion, or stored within animal rumens until the following spring; infused in boiling water during midwinter to relieve cough, stomach coldness, cold extremities, and rheumatism. Leaves used as forage and tea, with tea decoctions added to livestock drinking water to restore physical stamina. Trunks used to craft yurt crown rings (toono) and traditional cradle guardrails to symbolize longevity, fertility, and abundance. Roots carved into Mongolian chess (shatar) ornaments.	+(E): Ethnoveterinary use newly recorded; other uses documented in PR [45, 65, 67, 71, 77, 85]	19890331; 19940610; 20080311; 20100617
<i>Morus alba</i> L.	ᠮᠣᠷᠣᠰᠤ [Ilam]		Fr	Wild fruit	Edible	+(R): PR also for medicinal use [80, 77]	20080311; 20100617
<i>Neopallasia pectinata</i> (Pall.) Poljak.	ᠨᠡᠭᠡᠯᠠᠰᠢᠶ᠋ᠠ [daqʰa]		Se	Grain substitute	Edible	+(R): PR documented medicinal use [90] in addition to grain substitute use [79].	20100617
<i>Neotrinia splendens</i> (Trin.) M.Nobis	ᠨᠡᠭᠡᠳᠡᠷᠠᠰᠤ [dərəs]		WP/AP	Fodder/Material/Ecological/Industrial	Forage; woven into yurt frames/screens, curtains, shelters, and household wares; papermaking raw material; sand fixation and windbreak.	+: [64]	19930210
<i>Nitraria roborowskii</i> Kom.	ᠨᠢᠷᠠᠷᠢᠶ᠋ᠠ [xarmag]		St/Le/Fl/Se/Fr	Veterinary Medicine	Stems, leaves, flowers, and seeds crushed and applied topically to treat camel scabies/mange. Fruits used to treat digestive and metabolic disorders in the five traditional livestock species (horses, cattle, camels, sheep, and goats).	+(D): PR as wild edible fruit [82]	19900412; 19980322
<i>Olgaea leucophylla</i> (Turcz.) Iljin	ᠣᠯᠭᠡᠠᠯᠤᠰᠤᠨ [xəŋgərdʒɔla]		AP	Fodder	Promotes solid fat deposition in sheep	+: [62]	19820606
<i>Orobanche coerulescens</i> Steph.	ᠣᠷᠣᠪᠠᠨᠴᠢᠨ [təmə:n su:l]		WP	Tea substitute/Veterinary Medicine	Whole plant harvested in winter before snowfall, ground, and boiled for oral administration; used to treat diarrhea and constipation in young livestock.	+(D): PR also documented medicinal use [80, 88, 90]	19890331; 19970618; 20100617
<i>Oxybasis glauca</i> (L.) S.Fuentes, Uotila et Borsch	ᠣᠶᠢᠪᠠᠰᠢᠨ [lɔ:li]		Le	Vegetable	Leaves harvested in summer, boiled, and squeezed dry of excess water, then simmered together with milk and clotted cream (örom/naipi) for consumption.	+(R): PR also for forage use [62]	20100617
<i>Paeonia lactiflora</i> Pall.	ᠮᠠᠨᠣᠰᠤ [manɔ]		Fr	Tea substitute	Peels harvested in autumn; decocted as a tea substitute.	+(R): PR also for human medicinal and grain substitute uses [70,71]	20100617
<i>Panicum miliaceum</i> L.	ᠮᠠᠨᠢᠴᠢᠨᠠᠮᠤᠨ [məŋgɔl am]		Fr/St/Le	Beverage/ Grain/Sugar source /Fodder/Cultural	Seeds used for sugar production and alcohol brewing; roasted seeds serve as a traditional Mongolian staple food and are presented as ritual offerings during festivals and folk ceremonies. Distillers' grains, stems, and leaves are fed to cattle as fodder.	+: [27, 58]	19810204; 19890614; 19930126
<i>Phoenix dactylifera</i> L.	ᠮᠢᠷᠠᠭᠤᠰᠤᠨ [biragɔ:]		Fr	Veterinary Medicine	Pitted fruits fed to horses to treat equine diphtheria	*	19900304
<i>Plantago asiatica</i> L.	ᠯᠠᠩᠲᠠᠭᠤᠨ [uxəɾ ʊrgənə]		Le	Human Medicine	Heat-clearing, anti-inflammatory, sedative, hypotensive; topical wound repair.	+: [87,91,92]	19970510
<i>Plantago salsa</i> Pall.	ᠯᠠᠩᠲᠠᠭᠤᠨ [taram]		WP	Human Medicine	Decoction of old straw hat pieces and plantain taken orally to treat urinary retention.	*	19840122
<i>Polygala tenuifolia</i> Willd.	ᠯᠢᠭᠢᠭᠠᠯᠠᠨ [dʒurxən tʃəʈʃəŋ]		Ro	Veterinary Medicine	Treating respiratory disorders in the five livestock species.	+(D): PR as human medicinal plant for respiratory-related diseases [56,70]	19980110
<i>Polygonum aviculare</i> L.	ᠯᠢᠭᠢᠭᠠᠨᠠᠨᠠᠭᠤᠨ [butunə in su:l]		Le	Vegetable	Consumed fresh or sun-dried for winter use.	+(R): PR also for human medicinal use [57]	19940525

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<i>Populus euphratica</i> Oliv.	ᠠᠵᠠᠷᠠᠢ ᠤᠯᠢᠶᠠᠰ [tʰo:rai ʊliyas]		Ex/Le/WP/Tk	Fermentation/Ecological/Material/Fodder	Poplar alkali for dough leavening and laundry; soil amelioration; wood for furniture; leaves for livestock fattening and enhancing meat flavor/removing gaminess.	+(R): PR also for cultural uses [28,83,93]	19880540
<i>Potentilla chinensis</i> Ser.	ᠶᠡᠯᠢᠨ ᠲᠤᠯᠠᠢ ᠨᠠᠭᠨᠠᠢ [ʃil in tʰo:lai in taɳnai]		WP	Veterinary Medicine	Treating gastrointestinal disorders in livestock.	+(D): PR documented human medicinal use for gastrointestinal-related diseases and forage use [62]	19970618
<i>Potentilla discolor</i> Bunge	ᠠᠯᠠᠭ ᠲᠤᠯᠠᠢ ᠨᠠᠭᠨᠠᠢ [alag tʰo:lai in taɳnai]		WP	Veterinary Medicine	Treating gastrointestinal disorders in livestock.	*	19970618
<i>Potentilla longifolia</i> Willd. ex D.F.K.Schldt.	ᠤᠰᠤᠲᠤ ᠲᠤᠯᠠᠢ ᠨᠠᠭᠨᠠᠢ [usut tʰo:lai in taɳnai]		WP	Veterinary Medicine	Treating gastrointestinal disorders in livestock.	+(D): PR documented human medicinal use for gastrointestinal-related diseases and edible use [70,17]	19970618
<i>Potentilla potaninii</i> Th. Wolf	ᠪᠣᠷᠣᠯᠳᠠᠵᠢᠨ ᠲᠤᠯᠠᠢ ᠨᠠᠭᠨᠠᠢ [bʊrʊldʒin tʰo:lai in taɳnai]		WP	Veterinary Medicine	Treating gastrointestinal disorders in livestock.	*	19970618
<i>Prunus humilis</i> Bunge	ᠤᠯᠠᠨ [ʊla:n]		Fr	Wild fruit	Edible	+(R): PR also for medicinal use [27,65,76]	20080311; 20100617
<i>Prunus mume</i> (Siebold) Siebold et Zucc.	ᠬᠠᠷ ᠭᠤᠯᠢᠰ [xar guils]		Fr	Human Medicine	Deer antler and Chinese angelica root powdered in equal proportions, bound with plum juice into firmiana-seed-sized pills, and administered orally (50* pills daily on an empty stomach). Used to treat dull complexion, tinnitus, deafness, dry mouth, and lower back and leg pain.		20120609
<i>Prunus padus</i> L.	ᠮᠣᠨᠤᠰ [mɔil] ᠮᠣᠨᠤᠰ [mɔnɔs]		Fr	Veterinary Medicine/Wild fruit	Treats livestock gastrointestinal disorders; edible.	+(R): PR also for ornamental use [85,94]	19970418; 20080311
<i>Prunus sibirica</i> L.	ᠶᠡᠯᠡᠷᠢ ᠭᠤᠯᠢᠰ [ʃiwəri guils] ᠬᠠᠷ ᠭᠤᠯᠢᠰ [guils] ᠬᠠᠷ ᠭᠤᠯᠢᠰ [xəgərə in guils] ᠬᠠᠷ ᠭᠤᠯᠢᠰ [guilsən xargana]		Fl/Fr/Se	Wild fruit/Edible oil/Cultural/Ornamental/Human Medicine/Veterinary Medicine	Edible fruits. Seed oil treats coughs, burns, weeping sores, alopecia, and livestock pneumonia/wasting; flowers ornamental and used in toponymy/anthroponymy.	+(E): Veterinary use not recorded in PR; flowers recorded for human medicine in PR [90]	19940608; 19980110; 20080311; 20100617
<i>Pterocarpus indicus</i> Willd.	ᠤᠯᠠᠨ ᠳᠠᠵᠠᠳᠠᠨ ᠮᠣᠳ [ʊla:n dzandən mɔd]		St	Veterinary Medicine	Fumigation with red sandalwood and safflower to treat equine cold colic.	+(D): PR for human medicinal use [75].	19850346
<i>Pulsatilla chinensis</i> (Bunge) Regel	ᠢᠷᠭᠤᠢ [Irgui]		AP	Fodder	Promotes rapid ovine fattening; palatability decreases post flowering.	+(R): PR also for poisonous plant and ethnoveterinary use [61,67].	19820606
<i>Pyrrosia davidii</i> (Giesench.) Ching	ᠮᠣᠩᠭᠠ ᠲᠠᠢ [moŋx tʃai]		Le	Tea substitute	Stir-fried in butter, ground, and mixed with brick tea and milk.	+(R): PR also for medicinal use [47,76]	20100617
<i>Quercus mongolica</i> Fisch. ex Turcz.	ᠲᠠᠷᠠᠰ [tʃaras]		Ba/Fr/NS	Tea substitute/Veterinary Medicine/Fodder/Human Medicine	Bark autumn-harvested, butter-fried, and brewed as tea. Crushed plant material applied under saddle for equine back wounds (part unspecified). Fruits promote fattening; pork from fruit-fed pigs remedies urinary incontinence.	+(D): PR documented human medicinal use, ethnoveterinary use (drenching for livestock diarrhea), and tea plant (bark and leaves used for tea) [46,47,76]	19890331; 19900304; 19940228
<i>Reaumuria songarica</i> (Pall.) Maxim.	ᠪᠣᠳᠣᠷᠭᠠᠨ [ʊla:n bɔdurɣan]		AP	Fodder	Summer sheep fodder; promotes fattening and vitality.	+: [11,95]	19820505
<i>Rheum rhabarbarum</i> L.	ᠬᠢᠭᠢᠭᠤᠨ [xiʃigunə]		Ro	Veterinary Medicine	Treating gastrointestinal disorders in livestock.	+(D): PR for human medicine to clear heat and treat	19970418

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<i>Ribes diacanthum</i> Pall.	ᠬᠣᠨᠠᠢ [oxunai]		Fr	Wild fruit	Edible	constipation and dyspepsia [71]	20100617
<i>Ricinus communis</i> L.	ᠳᠠᠮᠠᠳᠵᠢ [damadzi]		Se	Human Medicine	Castor seed (3 seeds, peeled) & wheat flour (5 qian) pulverized and bandaged on right sole to facilitate delivery of retained dead fetus.	+(R): PR also for forage use [61, 69, 96]	19840122
<i>Rosa davurica</i> Pall.	ᠬᠢᠩᠭᠠᠨ ᠳᠠᠮᠠᠷ [xingan dzamar]		Le/FI/Fr	Veterinary Medicine	Anti-inflammatory; enhances digestive function in five livestock species.	+(D): PR as human medicinal plant (stomachic, rheumatism), wild fruit, and ornamental plant [75,86,88,94]	19980214
<i>Rubus idaeus</i> L.	ᠪᠣᠷᠯᠳᠠᠭᠤᠨᠠ [bo:rold3gonə]		Le/FI/Fr	Veterinary Medicine	Treating camel cough	*	19900412
<i>Rumex acetosa</i> L.	ᠬᠣᠷᠭᠠᠨ ᠲᠢᠭ [xurqan tji]		Le/AP	Vegetable/Tea substitute	Cooked leaves with milk/butter; autumn aerial parts brewed as tea.	+(R): PR also documented medicinal use and congeneric species used as a tea substitute [69, 76, 80, 91].	19890331; 20100617
<i>Salix</i> sp.	ᠤᠳ ᠮᠣᠳ [ud mōd]		RB	Human Medicine	Root bark decoction (~31.25 g/1 liang) taken orally to promote lactation (galactagogue).	+(D): PR for treating rheumatism and skin diseases, and congeneric species for construction, crafts, and fuelwood [76, 80, 88, 97]	19840122
<i>Salix</i> sp.	ᠪᠣᠷᠭᠠᠰ [burgas]		Blt	Material/Cultural	Crafted into "ölgei" (traditional Mongolian cradle); documented in Köke-Sudur (The Blue Chronicle).	+(R): PR also for forage and medicinal uses [59,61,77,84]	19880309
<i>Salsola collina</i> Pall.	ᠬᠠᠮᠬᠣᠤᠯ [xamxū:l]		WP	Fodder/Human Medicine	No specific use recorded	+(R): PR also for edible and fuelwood uses [55,62,97,98]	19940228
<i>Sanguisorba officinalis</i> L.	ᠲᠢᠪᠠᠭᠠ ᠣᠰ [tᠢbaga ows]		Rh/AP	Veterinary Medicine/Tea substitute	Dried rhizomes powdered for livestock GI diseases; autumn/winter aerial parts bundled and brewed in milk as a tea substitute.	+(E): PR for tea, external veterinary, and human medicinal uses [17, 85, 86, 90]; treating livestock digestive diseases not recorded.	19970510; 20100617
<i>Sibbaldianthe bifurca</i> (L.) Kurtto et T. Erikss.	ᠠᠲᠦᠲᠤᠯᠠᠢ ᠨᠠᠲᠠᠭᠠᠢ [atʃtʊ:lai in taɳnai]		WP	Veterinary Medicine	Treating gastrointestinal disorders in livestock.	+(D): PR documented tea substitute and human medicinal use [62, 68]	19970618
<i>Sonchus wightianus</i> DC.	ᠭᠠᠰᠤᠨ ᠨᠠᠭᠤᠰ [ga ʃʊ:n nəɣʊ:]		St/Le/WP	Condiment/Vegetable/ Human Medicine	Eaten raw with dips, pickled, and used medicinally.	+: [80, 86]	19960537
<i>Sophora alopecuroides</i> L.	ᠬᠣᠯᠠᠨ ᠪᠣᠵᠠ [xolan buja]		WP	Veterinary Medicine	Treating respiratory disorders in the five livestock species.	+(D): PR as a poisonous plant [83]	19980214
<i>Sorbus pohuashanensis</i> (Hance) McAll.	ᠲᠠᠰ [tas]		Fr	Veterinary Medicine	Treating metabolic disorders in five livestock species.	+(D): PR documented as an ornamental plant [94]	19980322
<i>Styphnolobium japonicum</i> (L.) Schott	ᠬᠠᠭᠭᠠᠳᠤᠲᠤᠭᠦᠳᠤ ᠮᠣᠳ [xəŋgəɔɖtʃəɣtʊ mōd]		Se	Human Medicine	Charred mixture of seeds and aged cotton blended with soy sauce; topically applied to treat wounds.	*	19840122
<i>Stipa</i> sp.	ᠬᠠᠯᠭᠠᠨᠠ [xIlqana:]		AP	Fodder	Promotes watery/soft fattening in sheep.	+: [58, 76]	19820606
<i>Stipa tianschanica</i> var. <i>gobica</i> (Roshev.) P. C. Kuo et Y. H. Sun	ᠮᠠᠩᠭᠣᠯ ᠣᠰ [māŋgɔl ows]		AP	Fodder	Promotes solid/oil fattening in sheep.	+: [58]	19820606
<i>Tamarix chinensis</i> Lour.	ᠰᠤᠬᠠᠢ ᠮᠣᠳ [suxai mōd]		Blt/Le/FI	Indicator	Branches/leaves develop white protrusions prerain; flowers whiten days prior, blooming profusely before heavy rain and sparsely before light rain (meteorological indicator).	+(D): PR for windbreak and sand-fixation, ecological knowledge of saline-alkali and desert environments, ritual, forage, construction, and craft uses [78, 79, 83]	19860141
<i>Taraxacum mongolicum</i>	ᠪᠠᠭᠠᠬᠠᠢ [bagwaxai]		St/Le/AP/Ro	Vegetable/Veterinary	Tender stems/leaves/aerial parts eaten raw with dips or pickled; roots and	+(R): PR also for human medicinal use [73]	19960537;

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Hand.-Mazz.	tʃətʃəŋ ᠲᠡᠵᠡᠲᠡᠳᠡᠭᠡᠨ [bagwagai tʃətʃəŋ ᠲᠡᠵᠡᠲᠡᠳᠡᠭᠡᠨ			Medicine	leaves treat livestock gastrointestinal diseases.		19970510
<i>Thermopsis lanceolata</i> R. Br.	[tarba:n ʃi:r]		WP	Veterinary Medicine	Treating respiratory disorders in the five livestock species.	+(D): PR for treating livestock wounds [66]	19980214
<i>Thymus mongolicus</i> (Ronniger) Ronniger	ᠲᠢᠮᠤᠰᠤ ᠮᠣᠩᠯᠢᠴᠢᠰ [gaŋga ows]		Fl/Le	Veterinary Medicine	Treating respiratory disorders in five livestock species.	+(D): PR as human medicinal plant for respiratory diseases [58, 68, 75]	19980110
<i>Thymus quinquecostatus</i> var. <i>asiaticus</i> (Kitag.) C.Y.Wu et Y.C.Huang	ᠲᠢᠮᠤᠰᠤ ᠶᠢᠨᠬᠡᠴᠣᠰᠲᠤᠰᠤ [xodʒ ows]		NS	Edible	Unspecified food use	+(R): PR also for human medicinal use [58, 71, 73]	20100617
<i>Ulmus pumila</i> L.	ᠤᠯᠮᠤᠰᠤ [xails]		Fr/Se	Human Medicine/Vegetable/C	Vegetable, lung-qi tonification, and paste fermentation.	+(R): PR also documented cultural use [71, 80]	20040127; 20100617
<i>Urtica</i> sp.	ᠤᠷᠲᠢᠴᠠᠭᠠᠢ [xar xalgai]		Le	Veterinary Medicine	Treats metabolic disorders in five livestock species	+: [71]	19980214
<i>Urtica cannabina</i> L.	ᠤᠷᠲᠢᠴᠠᠭᠠᠢ [xalgai]		AP/Le/In	Vegetable/Human Medicine/Veterinary Medicine/ Fodder (toxic in excess)	Tender leaves: vegetable, medicinal (calms Heyi, clears heat/toxins). Aerial parts: restore draft cattle strength. Leaves & inflorescences: decoction treats camel cough. Young plants (~4 fingers tall) toxic/induce fatal bloating in camels.	+(E): Ethnoveterinary use for camels and toxicological notes are newly recorded; other uses are consistent with PR [86, 88]	19970620; 19900412; 20080311; 20100617
<i>Xanthoceras sorbifolium</i> Bunge	ᠬᠠᠨᠲᠤᠴᠡᠷᠠᠰ ᠰᠣᠷᠪᠢᠯᠣᠮ [səŋdəŋ mɔd] ᠬᠠᠨᠲᠤᠴᠡᠷᠠᠰ ᠰᠣᠷᠪᠢᠯᠣᠮ [to:lai in bo:r]		Blt/Le/Se/Fl/ WP	Human Medicine/Tea substitute/Nut/Material /Ecological	Twigs and leaves: crushed extract treats arthritis and huyang-huangshui disease. Seeds: pediatric enuresis remedy, edible, and pressed for lamp oil. Wood: crafted into furniture. Leaves: used as tea substitute. Ecological use: windbreak and soil stabilization.	+(E): Treating pediatric nocturnal enuresis newly recorded; PR also documented religious and cultural uses [63]; other uses consistent with PR [76, 86, 88, 99]	20090506; 20100617
<i>Zingiber officinale</i> Roscoe	ᠵᠢᠩᠭᠢᠪᠡᠷ [tʃawag]		Ro	Human Medicine	Dispels cold, warms stomach, aids digestion, treats cold Badagan vomiting and diarrhea, pacifies Heyi disorders, and expels thick pulmonary phlegm.		19910343
<i>Ziziphus jujuba</i> var. <i>spinosa</i> (Bunge) Hu ex H.F.Chow	ᠵᠢᠵᠢᠫᠤᠰ ᠵᠢᠵᠢᠫᠤᠰ ᠰᠢᠨᠣᠰᠠ [ʊ:lin tʃawag] ᠵᠢᠵᠢᠫᠤᠰ ᠵᠢᠵᠢᠫᠤᠰ [xəɾə in tʃawag] ᠵᠢᠵᠢᠫᠤᠰ ᠵᠢᠵᠢᠫᠤᠰ [dʒərləg tʃawag]		Blt/Le/Fr	Fodder/Wild fruit	Preferred camel forage, human food.	+(E): Edible use recorded in PR [65]; forage use newly recorded.	19820505; 20100617

1193	1) The local Mongolian names of the plants in the table are shown in traditional Mongolian, and the international phonetic signs are marked in parentheses. [54]
1194	2) Used Part: AP Aerial parts, Ba Bark, Blt Branchlet, Bu Bulb, Ex Exudate, Fl Flower, Fr Fruit, Le Leaf, MC Megasporeangiate cone, NS=not specified, Ro=root, RB root bark, Rh rhizome, St stem, TR tuberous root, Tu tuber, WP
1195	Whole plant.
1196	3) Comparison with previous ethnobotanical studies: PR, previously recorded; +, consistent (uses in PR match SLX); +(E), extended by the present study (records in SLX expanded upon PR with newly documented uses); +(R),
1197	richer in prior literature (PR documented more diverse uses than SLX); *, new record (not documented in PR, representing a new record in SLX); +(D), divergent use (uses in PR differ from those in SLX).
1198	4) Reference Code (Ref. Code): Formatted as YYYYPPSS, where YYYY indicates the year of publication, PP indicates the issue number, and SS denotes the starting page number.
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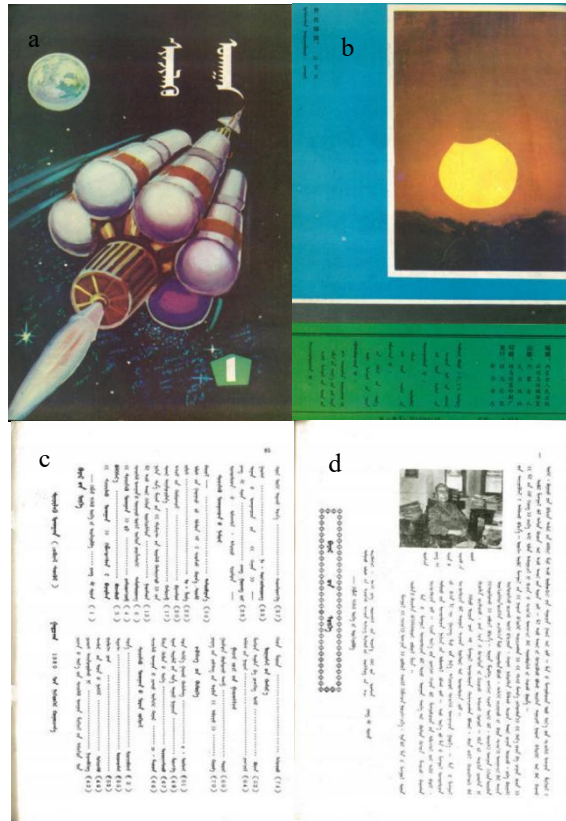


Figure 1

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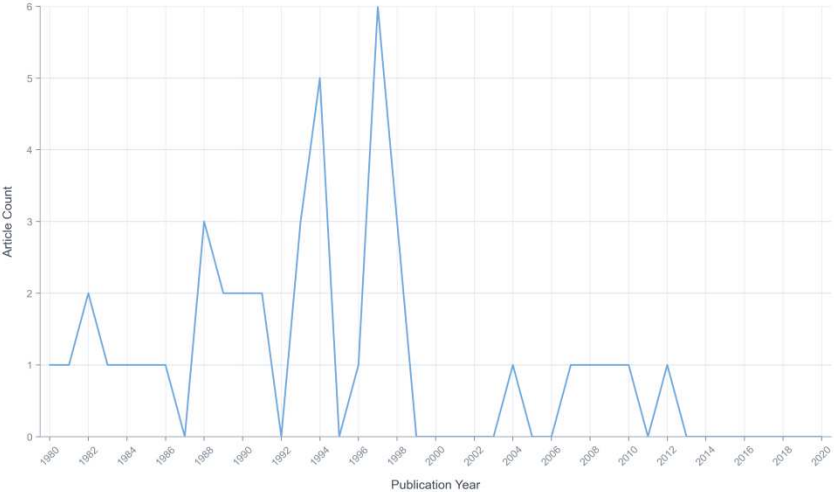
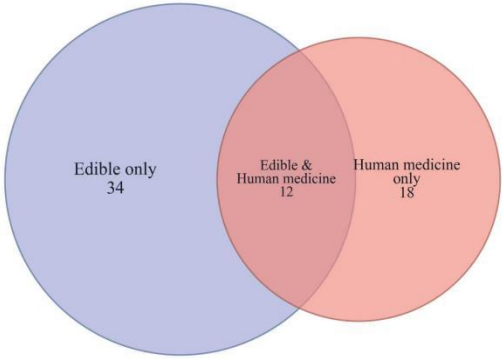
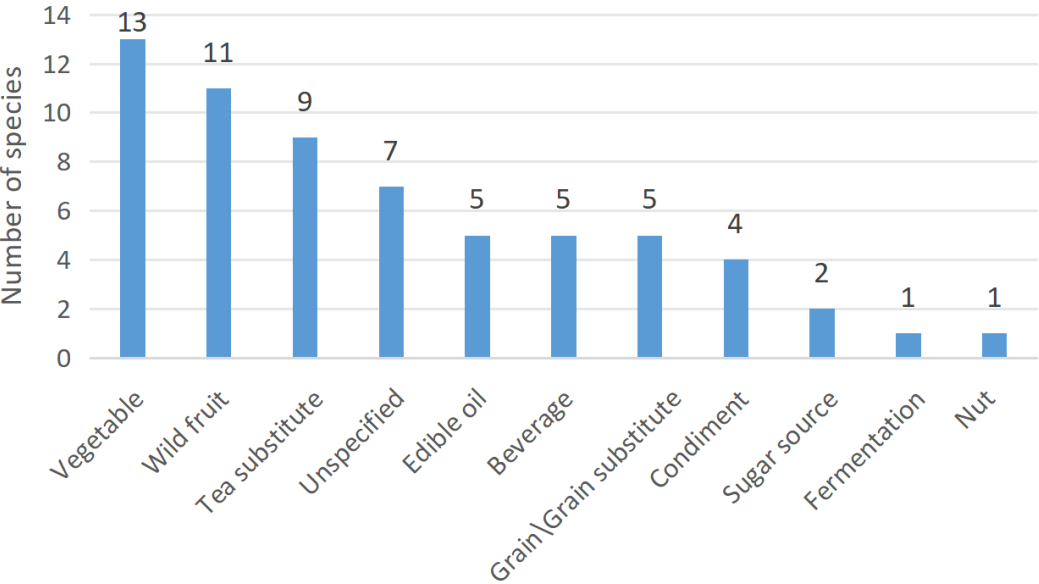


Figure 2

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1296 Figure 4



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