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A Preliminary Biocultural Study of Qinghai Rebgong Thangka: Postprint

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Date: 2023-07-13T00:00:00+00:00

Abstract

The reduction of biodiversity not only signifies the loss of genes, species, and ecosystems, but also threatens human cultural diversity. Thangka is acclaimed as the “encyclopedia” of traditional Tibetan culture, encompassing various aspects such as society, history, culture, religion, and medicine. As an important school of Thangka, Qinghai Rebgong Thangka is widely celebrated for its vivid and delicate depiction of figures and extensive portrayal of natural landscapes. This study integrates methods including literature analysis, artwork analysis, and ethnobiological field investigation to examine its biocultural aspects from two dimensions: the biological materials utilized in the creation of Rebgong Zhithang (painted Thangka) and the biological figures reflected in the content of Rebgong Thangka works. The results demonstrate that this research reveals the source organisms and production techniques of traditional painting tools and twelve natural plant pigments employed in Rebgong Zhithang; explores the origin, provenance, and cultural functions of biological figures frequently appearing in Rebgong Thangka works; and elucidates the ecological philosophy conveyed in the didactic illustrations of Rebgong Thangka. Overall, Rebgong Thangka not only derives materials from nature, but its content also reciprocally nourishes nature. Future efforts should place greater emphasis on the protection and inheritance of Rebgong Thangka’s traditional techniques and traditional knowledge related to biodiversity, and further explore its potential for traditional knowledge dissemination and nature education.

Full Text

Biocultural Profiles of Qinghai Regong Thangka

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Abstract: The loss of biodiversity not only signifies the disappearance of genes, species, and ecosystems but also threatens human cultural diversity. Thangka, acclaimed as the “encyclopedia” of traditional Tibetan culture, encompasses social, historical, cultural, religious, and medicinal dimensions. Qinghai Regong Thangka, as a major school of Thangka art, has gained widespread popularity through its vivid and delicate imagery and extensive depictions of natural landscapes. This study integrates literature analysis, artwork analysis, and ethnobiological fieldwork to investigate the biocultural dimensions of Regong Thangka from two perspectives: the biological materials used in Regong “Zhi Tang” (painted Thangka) production and the biological imagery reflected in the artwork. The findings reveal the biological origins and production processes of traditional painting tools and twelve natural plant-based pigments used in Regong Thangka. The study also explores the origins, sources, and cultural functions of frequently depicted biological images in Regong Thangka works and elucidates the ecological concepts conveyed through didactic paintings. Overall, Regong Thangka not only draws from nature but also gives back to nature through its content. Future efforts should prioritize the protection and inheritance of traditional Regong Thangka craftsmanship and its biodiversity-related traditional knowledge while further exploring its potential for traditional knowledge dissemination and nature education.

Keywords: Regong Thangka; resource plants; bioculture; traditional knowledge; eco-cultural protection area

Introduction

Since June 1992, over 150 countries have signed the Convention on Biological Diversity at the United Nations Conference on Environment and Development, marking the protection of biodiversity as an international consensus. However, biodiversity loss not only entails the loss of genes, species, and ecosystems but also threatens the diversity and unique structure of human culture. This cultural diversity is materially based on biodiversity, and its development provides support for biodiversity conservation and utilization. Globally, the positive influence of ethnic cultural diversity and excellent traditional knowledge on biodiversity has consistently remained dominant. How to protect or restore the value and practical achievements of biocultural diversity has been a crucial topic in biocultural diversity research. Global changes, particularly shifts in the world

economy, are profoundly affecting biocultural diversity, with many regions facing the dual loss of biological and cultural diversity. The Kunming-Montreal Global Biodiversity Framework, an important outcome of the fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity, also emphasizes biodiversity-related traditional knowledge and highlights the vital role of indigenous and local communities and traditional cultures in biodiversity conservation and sustainable use. Consequently, ethnic cultural diversity related to biology and the protection of biocultural diversity should receive high priority.

The term “Thangka” derives from the Tibetan word “Tang ga,” where “Tang” means vast plain in Tibetan, and “Tang ga” metaphorically describes the depiction of all things against the backdrop of the earth. Thangka creation themes involve religion, social history, daily customs, Tibetan medicine, astronomy, and calendrical systems. In Tibetan areas, nearly every household possesses Thangka. This portable scroll painting perfectly adapted to the nomadic lifestyle of the past, and early folk artists would use wooden sticks to narrate the stories depicted in Thangkas (commonly known as “Lama Mani”), playing an irreplaceable role in understanding and disseminating knowledge about nature, history, culture, beliefs, and traditions in Tibetan regions. Geographically and stylistically, Thangka can be classified into the Men Tang school in the Ü-Tsang region, the Qinze school in the Shigatse area, the Karma Gadri school in the Kham region, and the Regong school in the Amdo region. Regong Thangka originated in the mid-to-late 13th century and is currently one of the most widely disseminated and popular Thangka schools. Research on Regong Thangka began after 2000, focusing primarily on its historical origins and evolution, artistic characteristics and aesthetic connotations, and painting techniques and development status. However, previous studies have not deeply analyzed the creative content and radiating influence of Regong Thangka, nor have they provided detailed documentation of traditional knowledge regarding natural mineral and plant pigments and painting tools. Particularly, disagreements persist concerning traditional plant pigments, with some species unidentifiable due to reliance on local names or morphological descriptions alone, while others, such as “Molo,” a plant pigment used for water and cloud transitions, are nearly lost. These aspects are crucial for the inheritance and development of Regong Thangka traditional craftsmanship and the deep exploration of its biocultural connotations.

This study represents the first application of ethnobiological research methods to Thangka painting. Focusing on the four villages (Wutun, Nianduhu, Guomari, and Gashari) under Tongren County, the birthplace of Regong Thangka, and taking monastery and folk Thangka artists and their painted works as research subjects, we combined literature analysis, artwork analysis, and ethnobiological fieldwork. The study addresses three questions: (1) What biological connections exist in the traditional painting materials used for Regong Zhi Tang? (2) What are the origins and connotations of plant symbols frequently appearing in Regong Thangka? (3) How do the themes expressed in Regong Thangka relate

to the formation of local ecological concepts?

1.1 Study Area

Tongren City, Huangnan Tibetan Autonomous Prefecture, Qinghai Province, is located in southeastern Qinghai at the junction of three provinces—Gansu, Qinghai, and Sichuan—and serves as a transitional zone between the Qinghai-Tibet Plateau and the Loess Plateau. The Longwu River runs through Tongren from south to north, forming eastern and western mountainous areas and a central valley zone. The highest elevation reaches 4,767 m (Ami Xiaqiong Peak), while the lowest is 2,160 m (Maba Gully). The region features a continental plateau cool-temperate and cold-temperate semi-arid climate. As one of Qinghai's top ten resource counties, Tongren boasts widely distributed, high-quality mineral resources and over 200 species of medicinal plants, including rare animals such as musk deer and antelope, as well as valuable plants like snow lotus and Cordyceps. Ethnic minorities comprise over 90% of the population, predominantly Tibetan, along with seventeen other ethnic groups including Tu and Salar. In Tibetan, Tongren is called “Regong,” meaning “golden valley where dreams come true.” As one of the origins of Tibetan culture, Tongren is a national-level cultural ecological protection area and the only national-level historical and cultural city in Qinghai, with 34 intangible cultural heritage items above the district/county level and 41 cultural heritage protection sites. Among them, Wutun Village has been named a “National Cultural Industry Demonstration Base” and “Hometown of Chinese Thangka Art” by the former Ministry of Culture, while the Regong Academy has been designated as one of the first national intangible cultural heritage productive protection demonstration bases, with 13 Regong art transmission centers currently in operation. In 2009, “Regong Art,” including Regong Thangka, was inscribed on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity.

1.2 Research Objects

Regong Thangka can be divided into three categories based on materials and production methods: Gu Tang (silk Thangka), Zhi Tang (painted Thangka), and pearl Thangka. This study focuses on Zhi Tang painted with mineral and plant pigments, specifically examining the biological sources of traditional painting materials and the biological imagery commonly used in painting content and their cultural connotations.

1.3 Research Methods

We conducted a preliminary review of literature on “Regong Thangka” and “Regong Art” to understand the historical origins, development, painting techniques, artistic characteristics, and basic information on representative institutions and artists, laying the groundwork for fieldwork. Between 2022 and 2023, we visited 12 Thangka transmission centers, the Regong Art Museum, and the Regong Zanbara Mineral Pigment Research and Development Base in

Tongren City and its four natural villages (Wutun, Nianduhu, Guomari, and Gasairi). We conducted semi-structured interviews and participatory investigations with 42 Regong artists, including two national-level masters and three provincial-level masters. Survey information included traditional painting tools, pigments, and biological imagery in traditional painting content. Through interviews with informants, we obtained basic information on the animal and plant sources of Regong Zhi Tang pigments and tools, followed by field identification and voucher specimen collection guided by informants. We further verified reliability through indoor specimen identification and consultation of *Flora of China*, *Flora of China* (English version), and authoritative databases such as World Flora Online (<http://www.worldfloraonline.org>). For biological images depicted in Regong Thangka works, we used the currently published authoritative album *Selected Works of 100 Contemporary Regong Thangka Artists* and Regong Thangka works collected during fieldwork as models, combining artists' oral accounts and existing literature to verify and explore their origins and connotations.

2.1 Regong Zhi Tang Painting Materials

Regong Zhi Tang's traditional painting materials involve rich and diverse animal and plant sources throughout the entire production process. Regarding painting tools, except for gold-carving pens purchased externally, other biological materials are sourced from local livestock (such as yaks and goats) or other animal furs and common tree branches. Senior artists collect animal hair during specific months or pick up fallen branches after autumn to handcraft tools. For natural pigments, plant pigments are primarily herbs and shrubs, totaling 16 species across 16 genera and 16 families. Except for saffron (*Crocus sativus*), turmeric (*Curcuma longa*), madder (*Rubia cordifolia*), and *Symplocos sumuntia* purchased externally, other plant pigments are collected locally.

2.1.1 Painting Tools

Regong Zhi Tang painting tools mainly include canvas and frames, auxiliary tools, and brushes. Yak bone or hide glue, made by soaking, filtering, and boiling yak bones or hides, serves as a common adhesive, essential in both canvas preparation and pigment production. By mixing hide glue with kaolin clay and applying it to evenly woven, clearly textured white cotton cloth, then repeatedly grinding with pebbles (coarse grinding) and bowl rims or conch shells (fine grinding) before drying, the resulting canvas can hold heavy pigments and facilitates long-term preservation. Proper 调配 of different particle sizes or textures of pigments with hide glue is key to durable coloring. The prepared canvas is sewn in a zigzag pattern with fine cotton or hemp thread (Tibetan: "Jiang shi gu") onto bamboo frame strips (Tibetan: "Jiang xin") 1 cm wide with strong toughness, then secured a second time with outer frames (Tibetan: "Tang zhao") made of thicker steel or wooden strips, though outer frames are now often used for direct fixation [Figure 1: see original paper].

Auxiliary tools can be further divided into preparation tools, measurement tools, and painting protection tools. Preparation tools include porcelain or stone “stone mortars” for grinding pigments [Figure 1C: see original paper] and deer-skin pouches for storing pigments [Figure 1B: see original paper]. Deerskin is considered beneficial for pigment preservation due to its light-blocking, flexible, and breathable properties. Measurement tools include wooden compasses and “tougé” used for positioning (Regong artists call this step “qufang”). The “tougé” consists of a deerskin pocket filled with orange-red pigment, a 3 m long fine cotton rope, and a long wooden block tied at one end. Painting protection tools include painting pads (Tibetan: “Leze”) and cleaning tools. Painting pads are typically circular pads about 10 cm in diameter, stitched from lamb or otter fur with fabric, with a small loop at the center of the fabric for the little finger to secure the brush-holding hand [FIGURE:1D, E, F]. These pads not only support the arm and reduce drawing resistance but also prevent hand contact from soiling the canvas. Cleaning tools are typically used after Thangka coloring; in the past, highland barley dough mixed with butter was used, but now finer dough is more commonly used to roll on the canvas and absorb floating pigment particles.

Thangka brushes are also handcrafted from local animals and plants, mainly including charcoal pens, hair brushes, and gold-carving pens. Hair brushes can be further divided into coloring brushes (flat-filling and dyeing brushes) and outlining brushes (contour and detail brushes). Charcoal pens are generally made from branches of white birch (*Betula platyphylla*) and Qinghai poplar (*Populus przewalskii*), which are peeled, trimmed, and fired in a sealed pot [Figure 1J: see original paper]. Charcoal pens are used for sketching drafts due to their easy application and erasability. Hair brushes consist of a handle and bristles. A saying among past artists claimed “a good brush cannot be exchanged even for a horse.” Regong Thangka brush handles are typically made from wild goji wood (*Lycium chinense*) and cypress (*Cupressus funebris*) stems, which local artists believe can absorb sweat and prevent canvas contamination during painting. Bristles are usually collected during the March-April molting season, with specific materials varying by brush function. Outlining and detail brushes require long, sharp, stiff, and elastic tips, so Regong artists often select the sturdy hair from the back of healthy adult cats or squirrel tail hair [Figure 1G: see original paper]. Dyeing and flat-filling brushes require moderately long tips, thick round shapes, and soft-to-medium bristles, generally made from soft goat facial hair, long sturdy sheep back hair, or coarse black yak back hair [Figure 1H: see original paper]. Carving knives, used for gold pressing, require high hardness and are often ground from agate or “nine-eye” stones [Figure 1I: see original paper].

2.1.2 Painting Pigments

The five basic colors of Regong Thangka are white, stone yellow, bright red, Tibetan blue, and stone green. When these basic colors are mixed, there is a saying

that “color mixing is endless.” Regong Zhi Tang pigment sources can be divided into five categories: mineral, plant, metal, gemstone, and earth pigments. Mineral, earth, gemstone, and metal pigments are primarily used for most areas, including backgrounds. Metal pigments, mainly gold foil, are mostly used for outlining, while plant pigments serve as semi-transparent transition colors to harmonize the three-dimensional effect of the painting.

The list of plant pigments still used in Regong Zhi Tang is shown in Table 1. The processing steps for plant-based Thangka pigments are generally similar, mostly using alum for color removal, and mainly involve selection, cleaning, decolorization, boiling, filtration, evaporation, and pill formation. *Symplocos* leaves must be processed with lac resin (the purple resin secreted by lac insects after absorbing host tree sap) to create rouge color. Safflower, after crushing and filtering, must be rinsed with rice-washing water before evaporation and pill formation. *Meconopsis integrifolia* and saffron are used by thoroughly air-drying their utilized parts and then dipping them in water in pigment bowls. For black plant pigment, branches of Chinese pine (*Pinus tabulaeformis*) are burned at high heat, and the finest ash or lamp wick residue from butter lamps is collected and hand-ground with cowhide glue to form pills. This pigment offers advantages such as non-reflectivity and deep color tone.

2.2 Biological Images in Regong Thangka

Biological images commonly found in Regong Thangka can be functionally divided into four categories. The first category frequently appears in knowledge-based Thangka, serving as visual records of traditional knowledge related to biodiversity. For example, the Medical Thangka *Four Medical Tantras* depicts the morphological forms and preparation methods of over 900 natural medicines. Taking the opening chapter *Medicine Buddha and the City of Medicine* as an example, this painting portrays the palace of the Medicine Buddha (Bhaisajyaguru) [Figure 2: see original paper]. The palace collects various treasures, while the surrounding mountains are covered with plants, animals, and mineral medicines that can cure 404 types of diseases. On the southern “Pinda Mountain” grow pomegranate (*Punica granatum*), black pepper (*Piper nigrum*), long pepper (*P. longum*), and chili pepper (*Capsicum annuum*) for treating cold diseases; on the northern mountain grow sandalwood (*Santalum album*), agarwood (*Aquilaria sinensis*), and *Euchresta japonica* for treating heat diseases; on the eastern “Fragrant Mountain” grows *Terminalia chebula*, whose roots, branches, bark, leaves, flowers, and fruits can all be used medicinally; on the western “Malaya Mountain” are plains and hills covered with safflower, rocky areas rich in mineral medicines, and medicinal hot springs. Additionally, peacocks, parrots, and other birds perch on treetops in the medicinal forest, while elephants, bears, musk deer, and other animals that can serve as medicines dwell beneath the trees.

Furthermore, tree images serve as narrative frameworks (commonly called “tree metaphors”). In the Tree of Life in the Medical Thangka *Four Medical Tantras*

[Figure 3: see original paper], the blue, yellow, and white colors in the trunk represent the three factors—“Lung,” “Chiba,” and “Bacon”—that Tibetan medicine believes constitute the human body, while leaves of corresponding colors further indicate physical conditions, diagnostic methods, and treatment approaches under each factor’s dominance [Figure 3: see original paper].

The second category of biological images derives from specific stories, most commonly appearing in biographical Thangka of Buddhas, mountain gods, and Dharma protectors. Animal-related images are often abstracted, such as endowing deities with animal features, using local livestock or wild animals as mounts or hand-held objects, or creating “celestial animals” that do not exist in reality but combine various animal features through imagination. The most prominent plant image is the sacred tree, with each important moment in Buddha’s life associated with a corresponding tree. The most frequently appearing trees in Regong Thangka are sandalwood related to the South Asian origins of Mahakala, the God of Wealth; *Syringa reticulata* subsp. *amurensis* from the birth legend of Tsongkhapa, founder of the Gelug school; *Shorea robusta* (commonly called the “carefree tree”) associated with Shakyamuni Buddha’s birth and nirvana; and the bodhi tree (*Ficus religiosa*) associated with his enlightenment. The burned trunk or resin of *S. robusta* can be used as incense, while its seeds and fruits are used to make lamp oil, spices, or medicine. The most common herb is *Reineckea carnea*, the grass beneath which Shakyamuni is said to have attained enlightenment, which is also used medicinally by locals for moistening lungs and relieving cough. Cereal crops such as maize (*Zea mays*) and rice (*Oryza sativa*) often appear as hand-held objects of Vasudhara, the Goddess of Prosperity, symbolizing abundance and harvest.

The third category appears independently with more universal symbolic significance. The most prevalent is the lotus (*Nelumbo nucifera*), on which Buddhas and Bodhisattvas sit or stand, or which they hold in their hands. The lotus represents purity and detachment from worldly defilements. Since lotus does not naturally grow in the high-altitude Regong region, its image has gradually evolved into peony (*Paeonia × suffruticosa*) or chrysanthemum (*Chrysanthemum × morifolium*) styles, primarily in light red and pink hues. *Meconopsis* species (commonly called “Utpala flowers”) also substitute for lotus. Fruits frequently appear as offerings in Regong Thangka, with two symbolic sets being most representative: wood apple (*Aegle marmelos*) and mustard seeds among the “Eight Auspicious Symbols,” and three fruits representing “taste” among the “Five Sensory Pleasures.” Wood apple (commonly called Bengal apple) is considered the most sacred fruit, often depicted with a nipple-like round head supported by three leaves. Mustard seeds include white mustard (*Sinapis alba*) and *Brassica rapa* var. *oleifera* (commonly called black mustard), also used for oil extraction and medicine, symbolizing the elimination of all inauspicious signs. The three fruits representing “taste” in the Five Sensory Pleasures are typically abstracted based on pear (*Pyrus*), pomegranate (*Punica granatum*), and citron (*Citrus medica*), symbolizing “fortune, prosperity, and longevity.”

The fourth category primarily serves decorative landscape purposes, allowing artists creative freedom without strict requirements for accurate depiction. The groves in Regong Thangka refer to natural landscape belts composed of sacred trees (including spice and fruit trees), ponds, and streams, often interspersed between different spatial areas of the painting. These groves are considered ideal settings for spiritual practice, with common tree species including bamboo subfamily (*Bambusoideae*) plants, whose hollow stems symbolize letting go of ego; bodhi trees representing compassion and wisdom; sandalwood trees whose fragrance spreads far, considered miraculous; and monkeys paired with peaches (*Prunus persica*) also representing places of practice. As Thangka painting styles continue to develop, tree images have become increasingly enriched while depictions grow more abstract, even evolving into surreal forms based on imagination. For example, the “Wish-Fulfilling Tree” is modeled after North American *Magnolia* species, often depicted covered with gold, silver, and jewels, believed to be a celestial tree embodying people’s blessings and aspirations for a better life.

2.3 Ecological Concepts in Regong Thangka

Didactic paintings in Regong Thangka employ symbolic scenes from daily life to provoke discussion and reflection on ecological ethics or religious teachings. Essentially, these paintings revolve around profound discussions about how humans should exist with themselves, relate to others, coexist with nature, and maintain environmental sanctity. The “Six Longevity Figures” is one of the most common didactic themes in Regong Thangka, depicting six longevity objects existing in the South Asian “Great Joy Forest”: longevity rock, longevity spring, longevity tree, longevity beast, longevity bird, and longevity elder. These six longevity objects endure due to the blessing of Amitayus Buddha, cooperating symbiotically to maintain perpetual natural balance [Figure 4: see original paper]. The longevity mountain represents the earth, providing space for all things to grow; longevity water represents the water source, the fountain of all life; the longevity tree represents all plants; the male and female deer represent all animals; the crane represents the sky, symbolizing peace, joy, and auspiciousness; and finally, the elderly figure in the painting, who cares for the deer and crane, represents that all beings can dwell in eternal bliss if they comprehend the way of nature. The Six Longevity Figures remain popular and are widely used in Thangka, monastery or private residence murals, and even folk paper-cut works. The painting not only implies people’s criteria for a good environment—harmonious coexistence between humans and nature—but also cleverly corresponds to the basic elements of material cycling in ecology, serving natural education purposes.

3.1 Protecting Traditional Knowledge in Thangka Painting Techniques

Thangka is called “dancing in shackles” because of its extremely rigorous selection and processing of natural materials, painting themes, and techniques. Today, Regong artists still adhere to and inherit the traditional eight steps of Thangka creation (scripture chanting and material preparation, canvas stretching, draft drawing, coloring and shading, outlining, face opening, and mounting). However, among young artists, purchasing materials such as brushes instead of handcrafting them is common. While mineral pigments have basically achieved scaled production, only a few highly experienced senior artists master and process plant pigments. This situation arises partly from marketization and commercialization in recent years, leading some Regong Thangka artists to relax original standards in pursuit of economic interests, challenging the inheritance of Regong Thangka in terms of production procedures and material quality. On the other hand, influenced by Tongren’s climate and natural geography, the distribution range and collection time of biological raw materials are very limited. Considering the effort and cost of collection and production, some artists turn to slightly inferior alternatives. Meanwhile, Thangka artists’ market-oriented behavior in painting and inheritance exacerbates homogenization of Thangka works, undermining the traditionalism and diversity inherent in Thangka art. However, both biodiversity-related traditional knowledge in painting techniques and rich thematic content represent crystallized wisdom from long-term practice. We should strengthen rescue efforts for such traditional knowledge, conduct further investigations on germplasm resources, cultivation, and functional component analysis of natural dye plants to effectively protect biodiversity-related traditional knowledge in Thangka painting techniques.

3.2 Exploring the Natural Education Potential of Thangka Art

The biological images depicted in Regong Thangka are extremely rich and culturally diverse, primarily influenced by the religious nature of Regong Thangka and its historical development. Initially, monastery halls were the main platform for Regong Thangka development. After the 1959 religious reforms, when large numbers of monks returned to secular life, Regong Thangka began developing among the populace, expanding the creative community. Artists traveled extensively to Han regions, Tibet, Nepal, Mongolia, and other areas, continuously enriching Thangka painting themes and promoting the formation of the Regong style. For instance, Regong Thangka frequently uses images of tropical trees like the bodhi tree and *Shorea robusta* for depicting Buddha sitting under trees, primarily derived from South Asian “sacred tree worship” culture and the animistic beliefs of Bon religion, which hold that trees gather heaven and earth’s essence and support numerous lives, thus possessing noble status. The lotus, a famous Buddhist plant, has evolved into localized images of chrysanthemum, peony, and *Mecanopsis* species more familiar to the Regong region, making Thangka’s conveyed concepts more accessible and understandable. The symbolic meanings

of these biological symbols may not be scientifically explainable or supportable, yet they exist as objective phenomena in human society, profoundly influencing people's cognitive attitudes and protective actions toward natural landscapes and other living beings. In Regong's folk indigenous beliefs, the most prevalent is the sacred mountain belief system centered on Ane Xiaqiong, distributed along the Longwu River valley from upper Jiangshijia to lower Maba. Every village around Tongren builds temples for their sacred mountains and creates Thangka, murals, and statues. Mountain deities in Thangka often have their own mounts, commonly including livestock like horses and goats, as well as local wildlife such as red deer and wild yaks, or unique imaginative forms rendered from these. The treasure vase held by mountain deities continuously pours out jewels and nectar, symbolizing the growth of natural resources and wealth. Locals view mountain deities as pastoralists: high mountains and plains are their pastures, wild animals are their mounts and livestock, and wolves are guards watching over the pastures. All means of production in life find reflection in the mountain deity. Mountain deities hold noble status as they control local weather, resources, and wealth. When people view mountain deity Thangka and recite prayers, they gradually become familiar with the animals and natural landscapes appearing alongside the deity. When encountering wild animals, they naturally develop respectful attitudes and refrain from hunting; when passing through high mountains, canyons, and primeval forests, they never make loud noises, dig soil, destroy vegetation, or bring garbage to the mountains or take mountain things home. Regong artists perform sang-burning rituals before each pigment collection and Thangka painting to show respect. During the annual Regong June Festival, mountain deity Thangka normally enshrined in temples are brought out to receive offerings. Mountains truly exist, while the mountain deity Thangka, statues, and murals inside temples endow them with sacred and unique appearances, developing into folk ecological protection circles and ecological taboo cultural systems radiating from temples and sacred mountains. Thangka content creators create a more symbolic environment that integrates traditional knowledge and conforms to the Regong local cultural background to evoke people's care for the natural environment and cherish for other lives.

Regong Thangka painting materials are all sourced from nature, with traditional painting tools and pigments entirely derived from natural animals, plants, and minerals. Simultaneously, natural forms are projected onto Regong Thangka content creation in multiple ways: biodiversity-related traditional knowledge is visually expressed through Thangka; natural landscapes serve as sacred backgrounds; natural forms construct narrative frameworks; biological images are endowed with unique connotations; and ecological ethics are directly conveyed through fables. Overall, Regong Thangka demonstrates diverse connections with all things in nature, both in production materials and expressive content. As an important window for understanding the Qinghai-Tibet Plateau and Tibetan traditional ecological concepts, Thangka uses intuitive imagery to transcend language barriers between different ethnic groups, employing bright, pure colors and highly symbolic patterns to create sacred realms beyond the real

world, conveying the beautiful wish of harmony between heaven and humanity, and serving as an important medium for traditional knowledge dissemination and public education. Meanwhile, as a folk belief symbol, Regong Thangka presents the integration of biology, environment, and culture in a more inclusive and diverse form, uniting people from different regions and ethnic groups into a larger social unit through shared beliefs, with “ecological civilization, bountiful harvests, and peaceful living” as common aspirations. With deep and extensive public support in Tibetan Buddhist regions including Regong, Thangka serves as an excellent medium for knowledge dissemination and intergenerational education. Future efforts should emphasize parallel development of traditional Regong Thangka craftsmanship and open innovation while further exploring cultural connotations. We should also cherish this crystallization of human artistic and philosophical wisdom, fully applying it to nature education and utilizing it in building a sense of community for the Chinese nation. In future ecological protection and cultural inheritance work, we should incorporate considerations of biodiversity-related traditional culture, integrating policies with local concepts to better leverage the positive role of traditional knowledge and culture in ecological protection and future environmental education.

Acknowledgments

We sincerely thank the 42 Regong artists, including Yinba, Zhaxi Jiancuo, Wangde Zhaxi, Duoji, Gengtai, Jiumei Sanbao, Cai Rangdangzhou, and Zengtai Cairang, for sharing their knowledge. We also thank the staff of Longshu Painting Academy, Qinghai Tibetan Culture Museum, Ta'er Monastery, and Regong Tibetan Culture Museum for providing valuable information and images.

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