Her Majesty Queen Sirikit and the Conservation of the Wild Flower Fields in Northeastern Thailand

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Abstract

It is a great pride for Thailand and the Thai people, that Her Majesty Queen Sirikit takes a deep interest in the conservation of biological resources and the environment. While visiting the local populace and following up the royally initiated projects in rural areas across the northeast, Her Majesty has become fascinated by the unique, seasonal wetland habitat of multicolored wild flower fields or 'seasonal blanket marsh vegetation'. This fragile habitat is represented by the 'Lan Dusita' and 'Pha Taem' wild flower fields in Sakon Nakhon and Ubon Ratchathani Provinces respectively. At 'Lan Dusita' the beauty of the miniature flowering plants dominating the field has immensely pleased Her Majesty. And she has promptly granted the most common wild flowers the royal names: 'Dusita' (*Utricularia delphinioides*), 'Soi Suwanna' (*U. bifida*), Thip Kesorn (*U. minutissima*), Sarassa Chandhorn (*Burmannia coelestris*), and Manee Dheva (*Eriocaulon smitinandii*). As regards the conservation status, the miniature plants mentioned can be classified under the vulnerable category due to the habitat loss at an alarming rate by deforestation and urban development. Her Majesty has brought in earnest the splendour of the wild flower fields to the attention of the public and official authorities. She has instructed the government agencies concerned to take immediate action on the proper conservation measures for a revival of the neglected wild flower fields in northeastern Thailand.

Keywords: Her Majesty Queen Sirikit, Thailand, wild flower fields

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Her Majesty the Queen and the conservation of biological diversity

On the auspicious occasion of Her Majesty Queen Sirikit's 80th Birthday Anniversary in 2012, it is an appropriate time to mention an important role of Her Majesty the Queen in the nature conservation of the unique, picturesque wild flower fields or 'Thung Dokmai Pa' which are under threats from deforestation and urban development, especially in northeastern Thailand. A love of nature, forest, flora and fauna is deeply rooted in Her Majesty's character. She is always fascinated by the wilderness of a forest landscape with a variety of colorful, sweet-scented wild flowers. Her Majesty's passion for flowers and plants reflects an appreciation of and a deep concern for nature and biological resources that encompasses not just the pleasure of their aesthetic values, but also the need to care and nurture them.

For the past 60 years Her Majesty the Queen has accompanied His Majesty the King on their innumerable visits to the local populace in rural areas, and thus witnessed the drastic changes in ecosystems as a consequence of the massive forest destruction and modification. Over five decades, Her Majesty has long been dedicating herself to raise the welfare and livelihood of local villagers. She has also worked simultaneously on the conservation of natural resources and the environment. Whilst His Majesty focuses his attention on the development of water sources for agriculture, Her Majesty finds ways and means for the restoration of forest and watershed areas. Her Majesty is aware that deforestation will sooner or later bring hardship to local inhabitants. Hence, she has developed an idea to enable local villagers to live in harmony with forests. Her thorough understanding of nature and of the relationship between people and forests has given rise along this line to a vast array of royal initiatives in many areas across the country. Some examples include "*Forests Love Water", "Little House in the Big Forest", "Sirikit Reforestation"* and *"The Model Farm"* projects.

Her Majesty the Queen is a leading force not only in reforestation and sustainable forest management, but also in the conservation of native plants and other biological resources. She has promoted the conservation and breeding programs of some rare and threatened wild orchids, namely 'Inthanon Lady Slipper Orchid' (*Paphiopedilum villosum* Lindl. Stein) and 'Ueang Sae' (*Dendrobium scabrilingue* Lindl.), native to Mae Hong Son, for reintroduction into their natural habitats. Her

Majesty's work in the conservation of natural resources and the environment has admirably gained international recognition. Apart from several awards, in 1986 she was presented with a certificate by the World Wide Fund for Nature proclaiming her one of the world's leading conservationists. In 1992 the Asian Institute of Technology (AIT) presented her with a gold medal for her work in conservation. In 2010 the Royal Thai Government designated Her Majesty Queen Sirikit 'The Mother of Biodiversity Protection' in accordance with Her Majesty's lifelong duties dedicated to the protection of nature and biological diversity or biodiversity. In fact, she had led the conservation activities on biological resources more than three decades prior to the world community's creation of the Convention on Biological Diversity (CBD) in 1992. Many obligations contained in the Convention are surprisingly in conformity with Her Majesty's activities on the aspects of conservation and sustainable management of biological diversity.

Lan Dusita, a fragile habitat of seasonal blanket marsh vegetation

Her Majesty has clearly shown her fascination for the natural splendour of the wild flower fields in the northeast. Prior to 2005, Her Majesty normally went to the Phupan Palace in Sakon Nakhon during October-November to follow up various royal assignments in rural areas. While residing at the palace, after long and strenuous daily visits to the local populace and royal project work in remote areas, she loved to spend her free time in the breezy evening in the wilderness of the wild flower field adjoining the palace compound. Beyond the deciduous dipterocarp forest margins, the open, wet forest floor is enriched with a mass of miniature wild plants in bluish violet to deep violet blooms. They are small, erect inflorescences of tiny, delicate flowers clustered closely towards the end of the stalks. The flowers bloom gradually one after another. The beauty of this miniature plant pleased Her Majesty and she graciously granted it the royal name 'Dusita (ดุสิตา)'. Accordingly, the sandstone plain of the wild flower field is called 'Lan Dusita (ลานดุสิตา)'. Though Dusita dominates the field, there are also masses of color with other beautiful wild flowers of remarkable appearance. Additionally, Her Majesty named the tiny golden yellow orchid-like flowers 'Soi Suwanna (สร้อยสุวรรณา)'; the pale-pink or pinkish white flowers 'Thip Kesorn

(ทิพเกสร)'; the sky blue to mauve blue tulip-shaped flowers 'Sarassa Chandhorn (สรัสจันทร)'; and the compact white globose flower heads 'Manee Dheva (มณีเทวา)'.

The wet wild flower field or 'seasonal blanket marsh vegetation' in the northeast can be categorized ecologically as a type of seasonal wetland comprised of diverse flora, mainly herbaceous plants, grasses and sedges. This unique vegetation habitat is characterized by an extensive blanket-like layer of wet organic soils or substrates overlaying flat sandstone rock formations or 'Phalanhin' on the exposed floor of deciduous dipterocarp forest. After a long, hot and wet rainy season, cool breezes start to blow at the onset of the cold season and a variety of small flowering herbs profusely carpeting the wet ground floor come to life again. Their small, delicate and colorful flowers will soon competitively blossom, spreading their vivid floral beauty across the wide fields.

The main floristic components of these wild flower fields belong to the carnivorous genera of Sarai Khaonieo (สาหร่ายข้าวเหนียว)-*Utricularia* spp. (Lentibulariaceae) and Yad Namkhang (หยาดน้ำค้าง-*Drosera* spp. (Droseraceae), the mycotrophic to autotrophic genus of Dokdin (ดอกดิน)-*Burmannia* spp. (Burmanniaceae), and the other common genera of Kadum Ngoen (กระดุมเงิน)-*Eriocaulon* spp. (Eriocaulaceae) and Yabua (หญ้าบัว)-*Xyris* spp. (Xyridaceae). The height of the plants in full bloom varies from 7 to 25 cm, or rarely up to 40 cm, depending on topography, amount and distribution of rainfall, temperature, fire frequency, presence of dominant species and some other biotic factors. As regards the existing wet grassy habitat, climate, soil and soil water are the main interacting environmental factors that influence the distribution of these plants and plant communities. The seasonal wetland vegetation, as exemplified by the wet wild flower field Lan Dusita, is commonly encountered in the areas where precipitation and the stream draining water in the rainy season are their main water supplies. The soils in the wet field become temporarily water-saturated after heavy rain. Following the week-long blooming period, the substrates dry out and the plants completely wither and turn straw-colored in the hot dry season.

Due to the very poor nutrient availability in the wet substrate layer, the wild flowering herbs have to adapt themselves by means of trapping devices to capture microfauna to compensate for the lack of nutrients for their survival and growth. The carnivorous plants are thus abundant especially in the open wet ground floor of deciduous dipterocarp forest. The carnivorous plants of the genus Utricularia mostly inhabit water-saturated soils, where their tiny bladder-like traps can be perpetually exposed to continuously moving water through the substrates. Three miniature wild flowering herbs, Dusita, Soi Suwanna and Thip Kesorn thrive well in very wet soils which are poor in dissolved minerals, where their carnivorous nature renders them a competitive advantage. Their minute aquatic traps are capable of capturing mostly aquatic microorganisms. The other two small herbaceous plants are of autotrophic (Manee Dheva) or semi-mycotropic (Sarassa Chandhorn) habits. These wild flowering plants adapt themselves for their survival in inclement conditions. Most of the tiny plants are of herbaceous type, which has a short life cycle. They become fully grown and bloom in the shortest possible time in a single rainy season, and perish in the hot, dry season. The new plant growth will come to life again at an appropriate time in the next rainy season.

Botany of Her Majesty's favorite wild flowering plants

Botanical details (Taylor, 1989; Parnell, 2005) of Her Majesty's five favorite miniature plants proliferating in the wet wild flower fields are given below:

Dusita (ดุสิตา)-*Utricularia delphinioides* Thorel ex Pellegr. (Lentibulariaceae)

A small, delicate, carnivorous, annual herb, 8-20 cm tall. True roots absent. Root-like rhizoids and stolons infrequent, filiform. Traps usually few at flowering, mostly on leaves and stolons, minute, bladder-like, ovoid. Leaves solitary or few, delicate, laminar oblong-spathulate, 1-2.6 cm long, usually absent at flowering. Inflorescence erect, solitary, 10-45 cm long, usually 6-18-flowered. Flowers are many and always crowded near the apex, widely spaced low down and few. Bracts at the base, ovate, 2-6 mm long. Bracteoles linear, 2-3 mm long. Pedicels erect, 0.4-1.2 cm long.

Sepals fused, deeply 2-lobed. Petals fused, 2-lipped, asymmetrical, 0.5-1.2 cm long, blue, deep blue, blue-violet to metallic blue; upper lip erect, smaller than lower lip, lower lip spreading horizontally to erect, metallic silvery deep blue on inner surface, palate prominent, sometimes with a white streak on either side; spur 4-7 mm long, pointing downward, slightly curved. Stamens 2. Ovary superior, of 2 carpels with 1 locule. Fruit an ovoid, dehiscent capsule.

Dusita is distributed in Cambodia, Laos and Vietnam. In Thailand it is locally common in the northeastern, eastern and southeastern regions. It always grows in open, wet places, though it is a terrestrial plant amongst grasses and sedges in the flat sandstone terrain on the wet ground floor of deciduous dipterocarp forest and open pine savanna. It is found growing in a variety of marshy habitats including paddy fields at low elevations to ca.1400 m. Flowering occurs mainly from October to December.

Soi Suwanna (สร้อยสุวรรณา)-*Utricularia bifida* L. (Lentibulariaceae)

A small, terrestrial, carnivorous, annual herb, 7-30 cm tall, without true roots. Stems modified into rhizoids and stolons. Rhizoids filiform, branched. Stolons infrequent, filiform. Digestive traps numerous, bladder-like, reniform, 0.5-1 mm long, shortly stalked, borne on rhizoids and stolons. Leaves few, arising from stolon nodes, linear, 1-3 cm long, 1-nerved, membranous. Inflorescence erect, solitary, 6 -18 cm long, 1-9-flowered; flowers widely spaced. Bracts at the base, ovate, 1-2 mm long, occasionally pinkish tinged. Bracteoles minute, subulate. Pedicels 3-4 mm long, erect, strongly deflexed and enlarged in fruit. Sepals fused, deeply 2-lobed, lobes subequal, 2-4 mm long. Petals fused, 2-lipped, spurred, bright yellow, 6-10 mm long, upper lip erect, much smaller than lower lip, lower lip spreading horizontally to erect, both occasionally with red markings, palate prominent, deeper yellow; spur 3-6 mm long, facing downward, straight to slightly curved, long pointed. Stamens 2. Ovary superior, of 2 carpels with a single locule. Fruit broadly ellipsoid capsule, 2.5-3 mm, dehiscent, thin-walled.

Soi Suwanna is widely distributed in India, China, Taiwan, Japan, Southeast Asia and North Australia. In Thailand it is found scattered all over the country in moist to wet sandy, peaty-like substrate that is associated with soils or sediments derived from sandstone rocks. It is more gregarious in extensive patches in open wet grassy grounds on the flat sandstone rock formation in deciduous dipterocarp forest of the Korat plateau at elevations between 200 and 500 m, and up to ca.1300 m in the flat-topped sandstone mountains of Phu Kradueng and Phu Luang in Loei Province.

Thip Kesorn (ทิพเกสร)-*Utricularia minutissima* Vahl (Lentibulariaceae)

A small, terrestrial, carnivorous, annual herb, 5-12 cm tall, without true roots. Stems modified into capillary stolons and rhizoids. Stolons few. Rhizoids few, short, unbranched. Traps or digestive bladders numerous, minute, stalked, ovoid, mostly on stolons and leaves. Leaves few from peduncle bases and stolons, absent at flowering; leaf blade membranous, narrowly linear, 0.6-2.5 cm long, base tapering onto petiole, apex obtuse. Inflorescence solitary, erect, 4-8 cm long, 1-6-flowered; flowers widely spaced. Bracts narrowly ovate, at the base. Bracteoles similar but narrower. Flowers pale purplish-pink or white, 5-8 mm long, on erect flowering stalk. Sepals fused, 2-lobed, lobes equal. Petals fused, 2-lipped; upper lip very much smaller than lower lip, palate yellow, throat white; spur 2-3 mm long, pointing downwards, slightly longer than lower lip, straight; lower lip spreading; Stamens 2, at base of corolla tube, included. Carpels 2, connate into 1-locular, superior ovary. Fruit obliquely ellipsoid capsule, dehiscent.

Thip Kesorn is widespread from India, China, South Japan, Southeast Asia to North Australia. In Thailand it is sporadically found all over the country. It grows in wet sandy soil in open grassy places and wet sandstone terrain at low elevations. In northeastern Thailand, the plant grows on the wet grassy ground floor of deciduous dipterocarp forest in association with Dusita, Soi Suwanna, Sarassa Chandhorn, and Manee Dheva. Flowering is mainly from October to December.

Sarassa Chandhorn (สรัสจันทร)-*Burmannia coelestris* D. Don (Burmanniaceae)

A small, herbaceous, annual plant with chlorophyll, autotrophic or semi-mycotrophic. Stems green, slender, when flowering 10-30 cm tall. Leaves simple, with both basal and stem leaves. Basal leaves few, spirally arranged in a radical rosette at the base of stem, linear to lanceolate, 0.5-2 cm long, apex pointed, recurved. Stem leaves small, bract-like. Inflorescence 1 or 2-6-flowered; bracts lanceolate, 3-6 mm long. Flowers sky blue, mauve-blue, pale violet-blue or pinkish blue, with yellow tinge at the tops, 1-1.5 cm long, usually solitary or in a group of 2-3 at the end of slender and erect flowering stalk. Perianth tube actinomorphic, with 3 prominent, lateral wings. Tepals 6, in 2 whorls, outer tepals ovate-triangular, inner tepals triangular. Stamens sessile, arranged in 3 inside the perianth tube. Ovaries ellipsoid to obovoid, trigonous, 3-loculed, with axile placentation. Fruits capsular, obovoid, with persistent perianth, irregularly dehiscent.

Sarassa Chandhorn is widely distributed in India, Bangladesh, Southeast Asia and Australia. It is distributed all over Thailand, but is more abundant on the sandstone plateau of the northeastern region at elevations of 150-1,400 m. It grows well in marshy grassland with the wet carpet-like substrate overlaying the flat sandstone rock formation on the exposed ground floor of deciduous dipterocarp forest. It is commonly interspersed in between a variety of herbaceous plants, but rarely exists in dense clumps. Flowering time varies from September to December. The blooming period usually lasts for 2-3 weeks, or longer if the rain-fed water and stream draining water can continuously seep through the wet grassy fields.

Manee Dheva (มณีเทวา)-*Eriocaulon smitinandii* Mold. (Eriocaulaceae)

A small, terrestrial, tufted and rooted, annual herb. Stems 3-7 cm tall. Leaves simple, grass-like, narrow, linear, 3-5 cm long, spirally imbricated at bases appearing in a small tuft, leaf apex pointed, slightly recurved, leaf base sheathing. Inflorescence

stalk or scape several, arising from the basal rosette, erect, slender, much varying in length from 4-25 cm, angled, topped with white, globose, involucral head, 6-9 mm diameter, involucral bracts reflexed. Flowers minute, numerous, unisexual, with both sexes in the same head. Male flowers: sepals 3. Stamens 6 in 2 whorls. Female flowers: petals not prominent. Ovary superior, 3-loculed. Fruit a loculicidally dehiscent capsule.

Manee Dheva is confined to the Korat Plateau in northeastern Thailand. It is widespread on the exposed, flat sandstone rocks in deciduous dipterocarp forest. The plant grows in dense tufts, interspersed between Dusita, Soi Suwanna, Thip Kesorn and Sarassa chandhorn. Flowering occurs during September to December.

Conservation of the threatened wild flower fields in northeastern Thailand

The wild flower fields can be considered as hidden and neglected natural treasures of Thailand. Over the past four decades this plant community, which once extensively covered the sandstone plateau in the northeast, has been diminished or much degraded into scattered fragments. Deforestation, illegal forest encroachment, grazing, uncontrolled wild fire, and unsustainable development are all responsible for the depletion of the wild flower fields. In addition, this fragile wetland habitat can be affected by climate changes such as erratic rainfall and global warming. Although the five flowering plants are widespread, their conservation status can be categorized as vulnerable in Thailand due to the habitat loss at an alarming rate by deforestation and urban development.

Lan Dusita was hitherto the only well-known wild flower field in Thailand. In November 1999, Her Majesty the Queen spent a few days at the Sirindhorn Dam to visit the local populace in remote areas. In the evening of November 22,1999, she dropped in for the first time at Pha Taem National Park, Khong Jiam District of Ubon Ratchathani Province, to witness an unseen, wide stretch of the vast blooming field, undoubtedly the most extensive and massive wild flower field in Thailand. Over the open plain of the grand sandstone terrain in deciduous dipterocarp forest, one can be

fascinated with the magnificent work of nature in the multicolored blooming wild flowers. The field of miniature flowering plants in full bloom resembles in general appearance the 'Lan Dusita' wild flower field in Sakon Nakhon. But the 'Pha Taem' wild flower field is much more extensive and strikingly dominated by the bright golden yellow bloom of 'Soi Suwanna'. The other common wild flowers in the field are 'Dusita', 'Tip Kesorn', 'Sarassa Chandhorn' and 'Manee Dheva'. Thereafter Her Majesty made a yearly visit to 'Pha Taem' wild flower field until December 2005.

Because of Her Majesty's profound passion for the wild flowers, she has brought in earnest the picturesque wild flower fields to the attention of public and official authorities. Her Majesty has instructed the government agencies concerned to take proper conservation measures and undertake sustainable management of these threatened natural resources. To date the 'Pha Taem' wild flower field has become one of the ecotourism attractions in Ubon Ratchathani during the blooming period from October to December.

With Her Majesty's great concern over the conservation of natural resources and the environment she once said in a speech, ".....Thailand is fortunate that we can carry out conservation activities with hope and pride, because we still have sufficient natural resources needed for the country's economic, social and technological development. Therefore we must protect our invaluable natural heritage to the best of our ability. I truly hope that the Thai people will take pride in our natural beauty and in the prosperity of our lands. Let us all join hands in conserving our natural resources so that they may remain ours forever....."

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Figure 1: Her Majesty Queen Sirikit is holding a miniature plant, Manee Dheva (*Eriocaulon smitinandii* Mold.) in the wild flower field, Pha Taem National Park, Ubon Ratchathani (November 30, 2003).

Figure 2: One of the most extensive wild flower fields in Thailand dominated by the bright yellow bloom of Soi suwanna(*Utricularia bifida* L.), Pha Taem National Park, Ubon Ratchathani (November, 2001).

Figure 3: Dusita (*Utricularia delphinioides* Thorel ex Pellegr).

Figure 4: Soi Suwanna (*Utricularia bifida* L.).

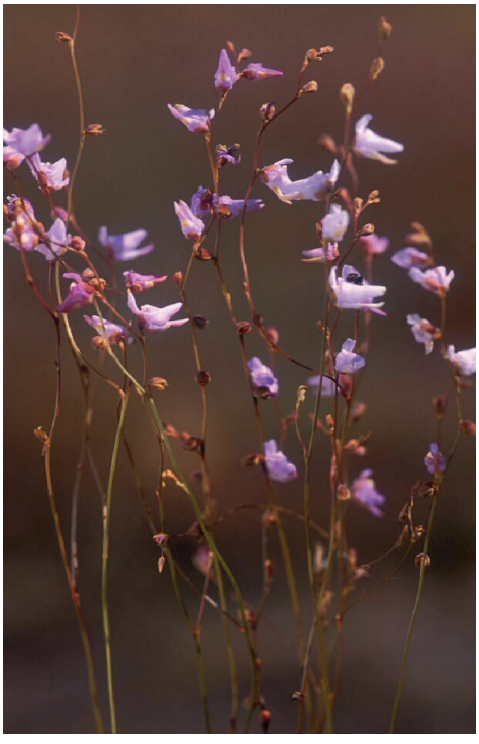

Figure 5: Tip Kesorn (*Utricularia minutissima* Vahl)

Figure 6: Sarassa Chandhorn
(*Burmannia coelestris* D.Don)

Figure 7: Manee Dheva
(*Eriocaulon smitinandii* Mold.)