



Orquídea

Orchids in the Historic Sanctuary of Machu Picchu



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INTRODUCCION

The Historic Sanctuary of Machu Picchu – HSM is located in an area with exceptional geographic characteristics. One can find snowy peaks higher than 6,000 MASL and the warmer, more humid areas of the Urubamba river at less than 2,000 MASL. Its sharp gradients, accentuated by the complex system of winds that this brings about, create microclimates that are the source of great biological diversity. The Historic Sanctuary of Machu Picchu – HSM is home to a huge diversity of orchids, close to 400 species.

Among the vascular plants, the Orchidaceae family is one of the largest and most diverse groups, with around 20,000 to 25,000 species divided into 1,800 genera. They are distributed over all continents except the poles and the driest deserts of the earth; there is even an underground species (*Rhizanthella gardneri*), which grows in the tropical areas of Australia.

Orchids never cease to amaze. Not only for the beauty of their flowers but also for their aesthetic attributes, expressed in fabulous and surprising shapes, colors, sizes and fragrances; they have evolved within very complex ecosystems. Their biological expressions are extremely interesting; their pollination mechanisms, the complexity of their flowers and the intricate ecological interactions with their pollinating agents, such as bees, wasps, butterflies, flies and hummingbirds is astonishing. Indeed, Darwin was not exaggerating when he said that the various stratagems used by orchids to attract their pollinators transcends the imagination of any human being. Furthermore, their symbiotic associations with fungi are essential in germination.

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The main threats that have endangered the orchid species of Machu Picchu and of Peru are the fractionation or loss of habitat caused by deforestation, agricultural extension and forest fires. more than 60% of their way of growth is epiphytic and their habitat is affected by tree felling. This, in addition to illegal trade (the uncontrolled collection of orchids for selling on the black market), the introduction of invasive species, the decline of pollinators and even climate change are all putting these plants at risk.

Orchid Conservation is a “task for everyone”, in which a joint effort should be made by researchers, orchidophiles, orchid growers, collectors and, above all, those who have resources in the field (habitat), in order to conserve, and thereby achieve their sustainable management and generate an economic alternative.

An important strategy for orchid conservation in the HSM, is to rescue plants that are about to perish due to natural causes, above all those that fall from branches (old trees), a common occurrence in the rainy or dry season. Another important group is the lithophytic orchids, that become detached from the rocky mountain surfaces, especially in the dry season.

According to the engineer Benett and the expert taxonomist Dr. Eric Christenson, our country has a diversity of between 2,500 and 3,500 species, owing to the wide range of microclimates. Peruvian orchids are among those most studied, due to the interest of recent research and scientific explorations carried out in the last twenty years.

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However, the greatest wealth is found in the tropics, above all in Central and South America where, according to floristic inventories and approximate calculations, countries such as Colombia, Ecuador, Peru and Bolivia far exceed 3,000 species. They are the most evolved and specialized plants, due to their ability to adapt to different habitats.

Throughout our land, we have various ecosystems such as dry forests, sub-tropical forests, tropical forests, hills, paramos, very wet forests, dwarf forests, cloud forests, inter-Andean forests, which together allow the plant growth of the different families, meeting their specific needs of a certain temperature and altitude level. The greatest diversity of orchids has been registered in the cloud forests and sub-tropical forests, the so-called “cejas de selva”, between 1,000 and 3,500 MASL, and the lowest diversity is found in the low jungle (300 MASL).

Around 400 species of orchid have been recorded in the HSM, distributed in 94 genera, with the greatest predominance of orchid species being: *Acronia*, *Anathallis*, *Epidendrum*, *Pleurothallis*, *Stelis*, *Maxillaria*, *Cyrtochilum*, *Lepanthes*, and others. Fifty to sixty percent of the orchids in the HSM are epiphytes, their roots stretch over trunks, branches and tree canopies. They feed on nutrients dissolved in rainwater and the accumulations of organic material around them. For this reason, forest conservation is very important for capturing and recycling nutrients, especially nitrogen. This research means that every year there is an increase in the number of new species recorded, sometimes breaking the endemism of some species from our neighboring countries, such as: *Vasqueziella boliviana* Dodson, *Lepanthes miraculum* Luer & R. Vásquez, *Trichosalpinx acremona* (Luer) Luer, among others.

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Lepanthes miraculum Luer & R. Vásquez



Trichosalpinx acremona (Luer) Luer

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Vasqueziella boliviana Dodson

A generalized idea of orchids is the image of a species with large flowers and very bright colors; but this preconceived idea is far removed from reality. In this edition, visitors will be able to appreciate a diverse range of native orchids from the “INKATERRA Orchid Trail”, where they will be able to see miniature orchids that can only be observed with a magnifying glass.

The collection of miniature orchids in the Botanical Orchid Garden of INKATERRA Machu Picchu Pueblo Hotel- ITMP includes some orchid flowers that measure barely a few millimeters and grow concealed between the trunks; notable are the genera *Cranichis*, *Cyclopogon*, *Brachionidium*, *Dichaea*, *Hofmeisterella*, *Lankesteriana*, *Lepanthes*, *Mesospinidium*, *Pachyphyllum*, *Trichosalpinx*, *Telipogon*, *Platystele*, *Stelillabium*, and some species of the genus *Epidendrum*, *Stelis*, with its enchanting miniature flowers that measure between 2 and 15 millimeters.

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Platystele oxyglossa (Schltr.) Garay

Miniature plant, epiphyte and lithophyte, racemose inflorescence

Flower of 1X1 cm.

Habitat: Cloud forest and Premontane Forest.

Flowering: All year round.



Platystele oxyglossa (Schltr.) Garay

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Telipogon selbyanus N.H.Williams & Dressler



Telipogon pogonostalix Rchb.f.

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In contrast, one of the largest flowers of the Orchids of HSM and of the world is the *Phragmipedium caudatum*, with its elongated, ribbon-like petals that can reach up to 80 cm in length. Others are very fragrant, such as *Odontoglossum praestans* Rchb. f. & Warsz., *Anguloa virginalis* Lindley, *Kefersteinia koechlinorum* Christenson, *Galeottia acuminata* (C. Schweinf.) Dressler & Christenson *Mesospinidium peruvianum* Garay, like the *Sudamerlycaste fimbriata* (Poepp. & Endl.) Archila, *Trichopilia fragrans* (Lindl.) Rchb. f. *Pleurothallis revoluta* (Ruiz & Pav.) Garay, *Sobralia dichotoma* Ruiz & Pav.; some emanate their fragrance at dusk,



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Phragmipedium caudatum (Lindl.) Rolfe

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The management of species in an orchid garden requires the replication of habitat factors such as: illumination, humidity, temperature and nutrients, which are necessary for seed germination and require very long and balanced vegetative periods (germination fungi and orchid seed-plantlet relationship).

Epiphytes such as: *Ada*, *Barbosella*, *Cranichis*, *Cyclopogon*, *Comparettia*, *Draconanthes*, *Echinosepala*, *Hofmeisterella*, *Rusbyella*, *Lepanthes*, *Lockhartia*, *Cyrtochillum*, *Kefersteinia*, *Kraenzlinella*, *Gongora*, *Oncidium*, *Odontoglossum*, *Maxillaria*, *Mesospinidium*, *Mormolyca*, *Stenia*, *Telipogon*, *Trichopilia*, *Stanhopea* etc., are fixed or tied using “pita pabilo” fiber on the branches or trunks of the afore-mentioned trees. Then a layer of moss is placed on the roots in order to provide humidity and, in addition, to constitute a kind of mesh for the retention of organic detritus and to perfectly withstand any climatic adversity without becoming detached, at least until the roots of the plant are able to provide fixture for themselves. Other epiphytes can be found on dead tree trunks.

It is important to know that orchid roots require adequate ventilation to avoid root rot. The optimal vegetative state of the plant depends on the good preservation of the roots. Therefore, roots in good condition mean vigorous growing plants.

The type of substrate determines the kind of watering and nutrition. Highly moisture-retentive substrates require little watering and are used with orchids that have thinner roots, such as: *Ada*, *Barbosella*, *Cranichis*, *Lepanthes*, *Platystele*, *Trichosalpinx*, *Telipogon*, *Stelis*. Conversely, when the moss is very loose, watering should be more frequent, as is the case with the majority of *Phragmipedium*, *Sobralia*, *Pleurothallis*, *Sauroglossum*, *Prosthechea*. In the case of *Epidendrum* epiphytes, with or without moss, they require frequent watering.

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A large proportion of orchids grow as epiphytes, which means that they attach themselves to the trunks and branches of trees, shrubs and even the woody stems of lianas, palms and tree ferns. More than 388 species have been recorded in the HSM.

Dry season and rotting during the rainy season

We try to rescue orchid plants in dry trees, or lying on the ground as a result of fallen branches or trees. The rescued plants are offered similar conditions to recover, grow and reproduce. Then they can be divided vegetatively and be returned to the habitat from which they were rescued. We apply our knowledge of orchids' ecological requirements (habitat, form of growth), acquired over more than fifteen years of experience in field work.

Orchids have specific requirements regarding altitude, temperature, light levels (high, medium and low) and the type of substrate, all of which must be respected. Some genera have great problems of adaptation, such as *Lepanthes*, *Trichosalpinx*, *Telipogon*, *Hofmeisterella*, many of which only thrive in conditions of high humidity.

Orchid care requires careful monitoring and the correct habitat conditions, as well as recording of the flowering and fruiting times of the plants being cared for.

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There are several options for substrate to which orchids can be tied, for example tree bark (the most highly recommended are *Erythrina falcata* “Pisonay”, *Erythrina edulis* “Monte haba”, *Myrsine pseudocrenata* “Chalanque”, *Ficus maxima*, *Inga adenophylla* “pacaemona”, *Nectandra reticulata* “Yanay argoz”).

In the Botanical Garden, there are collections of living native orchids that are provided with the conditions of their habitat.

Brachionidium carmeniae Luer

This is a plant of variable size, approximately 10 cm or more in height, terrestrial on Sphagnum (moss), leaves clearly lacerated, a single flower (uniflora) 1.5 cm in diameter, translucent sepals and petals, with deep purple-red veins and ephemeral flowering (two to three days). It is distributed in the mountains of the HSM between 3,000-3,200 MASL. It is apparently an endemic species of Machu Picchu.

Habitat: Premontane Forest. Flowering: August to November.

Brachionidium carmeniae



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Brachionidium inkaterrense Luer & C.Soto

Dedicated in honor of Inkaterra. This is a plant of variable size, 10 cm or more in height, of terrestrial growth on Sphagnum, coriaceous leaves, a single flower (uniflora) of 1 to 1.5 cm in diameter, translucent sepals and petals, with deep purple-red veins, petals with densely ciliated edges and ephemeral flowering (two to three days). It is distributed in the mountains of the HSM between 3,000-3,200 MASL. It is apparently an endemic species of Machu Picchu.

Habitat: Premontane Forest. Flowering: July to October.



Brachionidium inkaterrense Luer & C.Soto

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Epidendrum guislainae Hágsater & C.Soto, sp. nov.

In honor of Mrs. Denise Guislain McKee.

Epiphytic plant, 85 cm high, whereby the new stem is produced from a sub-apical internode of the previous stem. Fleshy roots. Simple stems, similar to a cane. Smooth leaves. Inflorescence 6 cm long, apical, from maturity, flowers only once in raceme.

Three to ten flowers, successive, green with purple-tinged column, calli and central rib of the lip, especially on the apex of the column which can be solid purple; fragrance not recorded. Sepals are free, spreading, narrowly elliptic, acute, fleshy, glabrous, without dorsal keel; veined dorsal sepal; elliptic lateral sepals, somewhat obliquely veined. Petals partially extended forwards, lanceolate linear, curved in an arc, acute, 3-veined, tiny ciliated margins, spreading. Lip attached to column, bilobed.

Triangular column when seen from the side, thin at the base and almost immediately strongly dilated, with a pair of rounded wings at the base of oblique apex, protruding on the side of the base of the lip - short and thick nectary.

Habitat: Cloud Forest and Premontane Forest.

Flowering: October - November.

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Epidendrum guislainae Hágsater & C.Soto, sp. nov.

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Epidendrum rousseffianae Collantes et Hagsater

Large plant 150 cm high, epiphytic, without pseudobulb.

Inflorescence apical, in raceme. Flowers 22-23, successive, pale green, resupinate.

Habitat: Cloud Forest and Premontane Forest

Flowering: March – May.



Epidendrum rousseffianae Collantes et Hagsater

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Gongora rufescens Jenny

Medium-sized plant, epiphytic, with ovoid pseudobulb. Inflorescence basal, in raceme, 40 cm high

Flowers 18-30, successive, flower 4.5 X 3 cm.

Habitat: Cloud Forest and Premontane Forest.



Gongora rufescens Jenny

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Habenaria corydophora Rchb. f.

Small plant, terrestrial. Terminal inflorescence, in raceme, 5 cm high, 4-5 flowers; green sepals, white petals and lip with blue gynostemium.

Flower 2 X 1.7 cm.

Habitat: Cloud Forest and Premontane Forest.

Flowering: January-May.



Habenaria corydophora Rchb. f.

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Hofmeisterella eumicroscopica (Reichenbach f.) Reichenbach f.

Small plant 10 cm high, epiphyte, without pseudobulb.

Terminal Inflorescence in raceme. Flowers: straw yellow petals and sepals, dark yellow lip, with purple veins.



Hofmeisterella eumicroscopica (Reichenbach f.) Reichenbach f.

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***Lycaste macrophylla* (Poeppig & Endlicher) Lindley**

Medium to large plant, terrestrial and lithophytic, with ovoid pseudobulb. Uniflorous basal inflorescence. Flowers: sepals with great variability in color, from green to purplish red; white petal with purplish-red streaks, white lip with purplish-red streaks; with diurnal, mild “aldehydic” fragrance.

Habitat: Cloud Forest and Premontane Forest.

Flowering: January-March; August-November.



***Lycaste macrophylla* (Poeppig & Endlicher) Lindley**

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Lepanthes menatoi Luer & R. Vásquez

Medium-sized plant, epiphyte, without pseudobulb.

Apical inflorescence, in raceme, 4 cm high.

Flower: 1.5 X 0.7 cm.

Habitat: Cloud Forest and Premontane Forest.

Flowering: All year round



Lepanthes menatoi Luer & R. Vásquez

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Lepanthes doloma Luer & R. Vásquez

Small plant, epiphyte, without pseudobulb.

Inflorescence in raceme, 3.5 cm high. Flower: 0.8 X 0.5 cm.

Thinly coriaceous leaves and the flower arises from the underside of the leaf

Habitat: Cloud Forest and Premontane Forest.

Flowering: All year round



Lepanthes doloma Luer & R. Vásquez

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Odontoglossum wyattianum G. Wilson

Small to medium-sized plant, epiphyte, with periform pseudobulb.

Axillar inflorescence, normally uniflora. Flowers: cinnamon brown sepals and petals, pinkish-purple center with a small white spot at the base, lilac lip with darker lilac veins on the lateral lobes, greenish-yellow callus.

Habitat: Cloud Forest and Premontane Forest.

Flowering: July-August.



Odontoglossum wyattianum G. Wilson

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Trichoceros antennifer (Humboldt & Bonpland) Kunth

Small, terrestrial and lithophytic plant, with pseudobulb.

Lateral or axillar inflorescence, the petals and lip of the flower have the appearance of a hairy fly, small pseudobulb.

Habitat: Andean Forest, Premontane Forest.

Flowering: January-February.



Trichoceros antennifer (Humboldt & Bonpland) Kunth

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Stanhopea nigripes Rolfe

Large plant, higher than 60 cm, epiphyte, with pseudobulb.

Basal and pendulous inflorescence, in raceme. Flower with diurnal fragrance. Flower: approx. 12 X 12 cm

Habitat: Cloud Forest and Premontane Forest.

Flowering: January-April; December.



Stanhopea nigripes Rolfe

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Trichosalpinx reticulata Thorerle & C.Soto

Small, epiphytic, cespitose plant. Coriaceous, grayish-green leaf with purple reticulation, broadly elliptic to circular, rounded apex 12 mm in length, 9-10 mm in width. Inflorescence in raceme of 2-4 flowers, dorsal sepal closest to rachis, light brown flowers with veins marked in red. Glabrous, membranous sepals, oblong dorsal sepal, concave at base, with 3 veins marked in red; long, narrow lateral sepals. Glabrous, obovate petals. Glabrous lip, elliptic with 3 veins.

Flowering: January – April.

It is distributed in the high mountains of the HSM, between 3,000-3,200 MASL. It is apparently an endemic species of Machu Picchu.



Trichosalpinx reticulata Thorerle & C.Soto

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Trichosalpinx reticulata Thorerle & C.Soto

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On Orchids, the Peruvian Orchid Society Bulletin

We hope you have enjoyed reading Orchids, now in its 91st edition. Our aim is to keep our friends all over the world informed about the huge diversity of orchids, their cultivation and reproduction and the activities of our society.

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