SEÇÃO / SECTION / SECCIÓN
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ORCHIDS AS A TOURIST RESOURCE IN THE SOUTHERN AREA OF MANABÍ PROVINCE

Klenin Stalin Rodríguez GUTIÉRREZ*, Adrián Eduardo Sánchez MACÍAS** & Maritza Sandra Pibaque PIONCE***

Abstract: This article consists of analyzing the potential of the endemic species and representative orchids of the province of Manabí that investigates and determines its importance for tourism. Given that Ecuador is one of the countries that has a great diversity of Orchidaceae families and other vascular plants, the province of Manabí presents important resources of wealth, such as orchids to develop a tourism offer of highly differentiated nature. A selection of sampling, participatory observations and interviews with key informants were conducted for the research development (25); a search for information was also carried out, including by reviewing publications and reports on botanical and tourism data. Sixty-one (61) orchids and five hybrids were identified in total. The most representative genus *Epidendrum* (6), *Oncidium* (5), *Dendrobium* (4) *Pleurothallis* (4) and *Stelis* (3). It is concluded that the identification, organization shows the need for interpretive hiking implementation, integrating education and conservation observing the orchids in their natural environment, allowing the generation of economic income by exploiting the potential of local communities, integrating all local actors.

Keywords: Biodiversity; Manabí; Orchids; Tourism.

LAS ORQUÍDEAS COMO RECURSO TURÍSTICO EN LA ZONA SUR DE LA PROVINCIA DE MANABÍ

Resumen: Este articulo consiste en analizar el potencial de las especies endémicas y representativas de orquídeas de la provincia de Manabí que investiga y determina su importancia de estas para el turismo. Teniendo en cuenta que el Ecuador es uno de los países que tiene una gran diversidad de familias de Orchidaceae y de otras plantas vasculares, la provincia de Manabí presentarecursosimportantesderiqueza, tales como las orquídeas para desarrollar una oferta de turismo de naturaleza altamente diferenciada. Para el desarrollo de la investigación se realizó una selección de muestreo, observaciones participativas y entrevistas ainformantes claves (25); también se realizó una búsqueda de información, adicionalmediante la revisión de publicaciones e informes en base de datos botánicas y de turismo. En total fueron identificadas sesenta y uno (61) especies de orquídeas y cinco híbridos, siendo de ellas el género más representativo *Epidendrum* (6), *Oncidium* (5), *Dendrobium* (4) *Pleurothallis* (4) y *Stelis* (3). Se concluye que la identificación, organización muestra la necesidad de implementación de senderismo interpretativo, integrando la educación y conservación observando las orquídeas en su entorno natural, permitiendo la generación de ingresos económicos aprovechando el potencial de las comunidades locales, integrando todos los actores locales.

Palabras claves: Biodiversidad; Manabí; Orquídeas; Turismo.

ORQUÍDEAS COMO RECURSO TURÍSTICO NA ZONA SUL DA PROVÍNCIA DE MANABÍ

Resumo: Este artigo consiste em analisar o potencial das espécies endêmicas e orquídeas representativas da província de Manabí que investiga e determina sua importância para o turismo. Como o Equador é um dos países que possui uma grande diversidade de famílias Orchidaceae e outras plantas vasculares, a província de Manabí apresenta importantes recursos de riqueza, como as orquídeas, para desenvolver uma oferta turística de natureza altamente diferenciada. Uma seleção de amostragem, observações participativas e entrevistas com informantes-chave foram realizadas para o desenvolvimento da pesquisa (25); também foi realizada uma busca por informações, inclusive através da revisão de publicações e relatórios sobre dados botânicos e turísticos. Sessenta e um (61) orquídeas e cinco híbridos foram identificados no total. Os gêneros mais representativos *Epidendrum* (6), *Oncidium* (5), *Dendrobium* (4) *Pleurothallis* (4) e *Stelis* (3). Conclui-se que a organização de identificação mostra a necessidade de implementação de caminhadas interpretativas, integrando educação e conservação observando as orquídeas em seu ambiente natural, permitindo a geração de renda econômica, explorando o potencial das comunidades locais, integrando todos os atores locais.

Palavras chave: Biodiversidade; Manabi; Orquídeas; Turismo.

* Student of the Tourism career, Faculty of Economic Sciences at the Universidad Estatal del Sur de Manabí, Jipijapa, Ecuador. He has participated with several presentations in national and foreign scientific events (Cuba). Recognition for the contribution in the Scientific-Technical field in the contest of recognition to the research of Universities of Ecuador, National Awards 2017 of the SENESCYT. [klenin_94@hotmail.com]

** Student of the Tourism career, Faculty of Economic Sciences at the Universidad Estatal del Sur de Manabí, Jipijapa, Ecuador. He has participated with several presentations in scientific events. Recognition for the contribution in the Scientific-Technical field in the contest of recognition to the research of Universities of Ecuador, National Awards 2017 of the SENESCYT. [adriams.mac@hotmail.com]

*** PhD in Pedagogical Sciences / UIA (2016). Master in English Language Teaching / UNESUM (2009). Diploma in University Evaluation and Accreditation / UACH (2005). Master in University Teaching and Pedagogical Research / UNL (2002). Doctor of Education Sciences / ULEAM (2000). Bachelor of Science in Education / UTM (1994). Postgraduate Professor in Educational Management and English Language Teaching. Coordinator of the UNESUM Language Center. Full-time professor and researcher at the State University of South Manabí. Visiting scholar in Cuba, Argentina. ORCID: https://orcid.org/0000-0002-2652-4799 [m1_aritza@hotmail.com]

1 INTRODUCTION

The lowlands of the Ecuadorian coast, between the Andes Mountains and the Pacific Ocean, are considered world-wide as a region of high biodiversity and a high level of vascular endemism (Dodson & Gentry, 1991).

Orchids are the most appreciated plants in the world due to its elegance and beauty around its texture and extravagance of these plants (Piluek & Triboun, 2008). Thus, the declaration of Ecuador as a country of orchids aims to strengthen the development of tourism of nature and ecotourism, (MITUR,2017) being these tourist modalities, the most suitable for the protection of the exuberant flora.

Among this plant wealth, there are more than 1,300 species of ferns, representing a little more than 8% of the country's vascular flora; 134 species of palm trees and 4. 300 species of orchids, that is, that almost one in four plant species growing in the country's wild habitats is an orchid and represents more than 18% of the world's total orchid species (MAE, 2015).

The study emphasizes endemic and representative orchids in the province of Manabí and the importance of these for the growth of tourism, taking advantage of wild orchids as a tourist resource emerges from the interest of society by the aesthetic and functional attributes of natural resources. The added value of the experience of observing the growth and flowering of the orchids.

According to Pickering & Ballantyne (2013), there are several types of orchids tourism according to the travel motivations and their special characteristics, whose objective is to capture the attention of visitors to encourage the conservation of the habitat of the orchids and generate complementary economic income.

Santamaria & Bayas (2018) showed that tourism generates beneficial effects in the local economies, through the provision of services generating economic well-being for the entire beneficiary population, satisfies their needs and improves their standard of living.

2 LITERATURE REVIEW

Orchid plants are found in virtually every continent where there is vegetation. However, its distribution is not uniform, and is especially concentrated in the tropical regions of the planet. The factors that have been associated with the diversity of orchids are habitat diversity, geology, climatic variability and degree of isolation (Pupulin, 2005).

The tourist activity revolves around mainly the exploitation of natural and cultural resources. The expectations related to the rest, recovery and encounter of man with nature stand out mainly. The process of deterioration of natural ecosystems with tourism potential is mainly generated by other economic activities.

Orchids have varied anthropogenic interests: medicinal, nutritional, cosmetic, as well as sociocultural and religious. The possession of large private collections (for which illegal traffic is a very lucrative, but not sustainable business), is another of the greatest interests. However, the most popular use of orchids is aesthetic, to beautify spaces, for the interest and harmony it causes. Orchids have the highest value in commercial horticultural production and are, consequently, the most prone to illegal poaching of wild plants (Roberts & Dixon, 2008).

In addition to successful initiatives to preserve natural habitats, many projects around the world have shown that it is possible to bring both threatened species to cultivation, and successfully reintroduce them into nature (Seaton *et al*., 2013).

Different proposals for sustainable tourism coexist according to the type of ecosystem we visit (Hall, 2015). In the plain, which extends to a great extent, we can find populations of large animals that can be easily observed by the type of landscape. In wet areas we can delight in bird watching. Mountain landscapes are best suited for hiking, while coastal landscapes are more used for sports (Liang, 2017). Forested areas are very rich in biodiversity, but little frequented by the difficulty of observing the fauna and flora of the place.

In this way, sustainable use through tourism is essential in ex situ conservation forms. Although ex situ orchid conservation techniques should not be seen as a substitute for effective in situ conservation programs, they are of paramount importance due to the risks and problems involved in the conservation of populations in situ (Seaton et al., 2010).

An important part of the integration of biodiversity into tourism, and other sectors and activities, is also to make the concept of biodiversity less abstract by linking it to the economic and social benefits it provides, and by relating the continuation of tourism from nature to the protection of the environment on which it depends (Eshun & Tagoe-Darko, 2015). The sustained growth of nature tourism is a key factor for many Latin American economies, such as that of Costa Rica. For many people this country has become synonymous with ecotourism, (Thompson *et al*., 2018).

The saturation of the market with traditional floricultural products, such as roses, carnations, chrysanthemums, gerberas and orchid hybrids, has promoted a growing interest in novelties, whether cultivars or introductions of wildlife, so that countries are looking for in its native flora the potentiality (Heywood, 2003).

Most international travelers visiting Latin America are not only going to explore the streets of cities, but also visit forests to see wildlife, walk through the mountains and experience the many natural and cultural wonders that the region offers, (Byrne & Tandy, 2015). While nature tourism becomes more popular in the region, with greater numbers of tourists visiting national parks, protected areas and unique ecosystems, the need to integrate biodiversity with tourism planning and development at national, regional and international levels.

It should also increase in importance of conferences on the loss of biodiversity in Latin America. Among these potential negative consequences is pollution, habitat destruction and the eviction of local people (Dangi & Gribb, 2018). Several genera and species of orchids are also considered in the tropical flowers group. However, among other things, the size and weight of these flowers complicates their handling and post-harvest, factors that make them more expensive for the consumer (Pizano, 2005).

This is an example of the broad path to follow in the search for floricultural developments. While it is indicated that orchids are among the most important floricultural products of international trade, it is important to highlight that hybrids and orchid cultivars are based on a few genera, mainly Phalaenopsis, Dendrobium, and Cymbidium. If one considers that the Orchidaceae family, within the angiosperms is the second most abundant in species, with about 25 000 species and 736 genera (Dressler, 2005; Chase et al., 2015), it goes without saying that the land of Orchids to explore is very broad, from the point of view of their ornamental characteristics.

In America, Colombia and Ecuador share the world's largest orchid wealth, with 9,000 species, and about 3,000 are in danger of extinction due to the deforestation of the Andean forests. Its conservation programs motivate awareness, and the programs seek to establish an ecological and social balance (Orejuela-Gartner, 2012).

The biological diversity of Ecuador currently represents 7.6% of the vascular plants registered throughout the planet. The largest number of species corresponds to herbs, followed by epiphytes. Among this plant richness there are more than 1,300 species of ferns, which represent a little more than 8% of the vascular flora of the country; 134 species of palms and 4,300 species of orchids, that is to say that almost one in four species of plants that grow in the wild habitats of the country is an orchid and represent more than 18% of the total orchid species in the world, approximately one third of them considered endemic (Mites, 2008).

Orchids, one of the largest botanical families of angiosperms (flowering plants), (Dressler, 1993), are among the most vulnerable plants, due to overexploitation of the wild, illegal traffic, habitat loss and climate change, in combination with its intricate network of biotic and abiotic dependencies, which make them ideal species models for conservation programs (Swarts & Dixon, 2009). They are plants widely used as flag species in conservation debates (Cribb *et al*., 2003).

The tourist activity revolves around mainly the exploitation of natural and cultural resources. The expectations related to the rest, recovery and encounter of man with nature stand out mainly. The process of deterioration of natural ecosystems with tourism potential is mainly generated by other economic activities. We must bear in mind that the more tourists visit an area, the greater the consumption of resources in it, so the benefits of biodiversity tourism should be improved, and the negative environmental impacts associated with this tourism should be limited (Hall, 2010). Through the income generated by tourism, we can raise awareness of the value that the planet's biodiversity offers us (Thompson *et al*., 2018).

3 METHODOLOGY

The development of this research took place for one year (2017-2018). The area of study extends in the province of Manabí, covering zones of different vegetable formations like mangrove, semideciduous forest and deciduous of lowlands, dry thicket of lowlands, dry coastline, coastal thorn, forests always green and semideciduous piemontanos according to Cerón, Palacios, Valencia, and Sierra (1999).

Selective sampling of species of the Orchidaceae family, participatory observation, was carried out in 12 key areas: San Lorenzo, El Aromo, Cerro Montecristi, Pacoche, Machalilla National Park (PNM)Sender El Rocío, Pisloy, Rio Platano, Campozano, Cerro Olina, Las Guaijas, Monte Oscuro, Paja Luisa.

Structured interviews were also conducted with the leaders of these communities. The interviews were chosen with key people to get the highest quality of the data and a more vivid interaction with the interviewed (Harris & Brown, 2010). In total, 25 interviews were carried out, with all the interviews and data collected, the most relevant declarations on orchids were processed, to which they would finally qualify in each entry on their issue (Smith, 2010).

In addition to interviews, the documentation and reports on botanical and tourism data were collected and reviewed. The following methodological scheme was made from the literature showing criteria for the identification of orchids species with potentiality for tourism, its representativeness and biological criteria (situation of threat and biological importance of species and abundance) were taken into account, aesthetics (attributes of beauty and pleasing to the community) and cultural (social conception or worldview that exists around the species).

These criteria were applied to the findings of the study as an evaluation scale for species selection.

Table 1: Criteria for species selection.

Criterion	Item	Description	Attribute	Rating
Biological Component 40%	Degree of threat 15%	IUCN, CITES, Red book, regional and/or local Standards	Critically endangered	15
			In Danger	15
			Vulnerable	10
			Almost threatened	10
			Minor Concern	5
			Insufficient Data	0
			Not evaluated	0
	Endemism 15%	Own and exclusive Species of the department	Endemic	15
			Non-endemic	5
			Immigration	3
	Geographical Distribution 10%	Range of distribution in the department's eco-regions	Wide Range of distribution	10
			Limited Range of distribution	5
Cultural partner Aspect 30%	Socio-cultural Importance 30%		Associated with cultural and mythical landscapes	0-5
			Ecotourism	0-2
			Biological Control	0-2
			Traditional Use	0-2
			Worldview	0-5
			Symbology	0-2
			Ritualistic	0-2
			Traditional Medicinal	0-2
			Public Recognition	0-5
Aesthetic 30%	For each one of the items fulfilled 30%	The species is conspicuous by	Color	0-3
			Sounds	0-3
			Aromas	0-3
			Size	0-3
			Way	0-3
			Harmony	0-3
		That feeling generates the species	Tenderness	0-3
			Force	0-3
			Memories	0-3
			Rooting	0-3

Source: GAICA (2013).

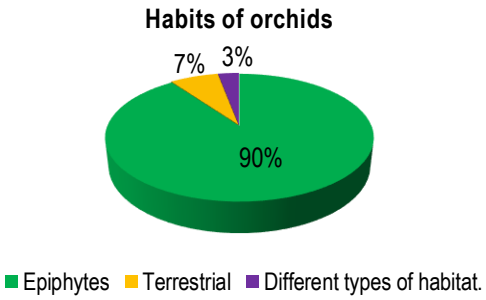
4 FINDINGS AND DISCUSSION

As a result of the work within the study area, a list was obtained with 61 species of orchids and 5 hybrids with potential for tourism development in the province of Manabí. The genus Epidendrum is the predominant with six (6) species, followed by *Oncidium* (5 species) and *Dendrobium* (4). Other registered genera were: *Anathallis, Arundina, Benzingia, Brassia, Catasetum, Cattleya, Cyclopogon, Cyrtochiloides, Dichaea, Dimerandra, Dracula, Dryadella, Elleanthus, Encyclia, Erycina, Erythrodes, Gongora, Lepanthes, Macroclinium, Maxillaria, Notylia, Ornithocephalus, Osmoglossum, Pelexia, Pescatorea, Phragmipedium, Pleurothallis, Prosthechea, Psychopsis, Rodriguezia, Scaphyglottis, Sobralia, Stanhopea, Stelis, Trichocentrum, Trichopilia, Zelenkoa* and *Zygostates*. (Appendix 1).

a) Assessment of the biological component

It can be appreciated in this investigation regarding the habits of orchids 91% are epiphytes, and 7% are terrestrial, and 3% of them tolerate partially different types of habitat. (Fig.1).

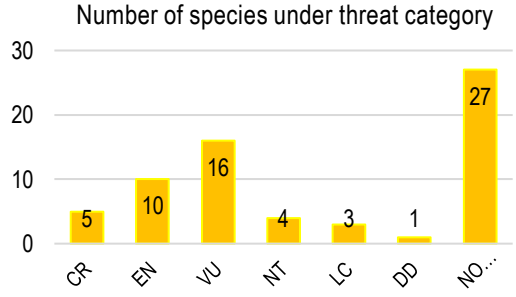
Fig. 1. Habits of orchids.



Source: proper elaboration.

The categories of threat that the species report according to IUCN criteria are 8% under Critical Hazard (CR), 15% In Danger (EN), 24% as Vulnerable (VU), 6% Near Threatened (NT), 5% in Minor Concern (LC), 2% as Insufficient Data (DD) and 41% are not registered in this system. (Fig. 2).

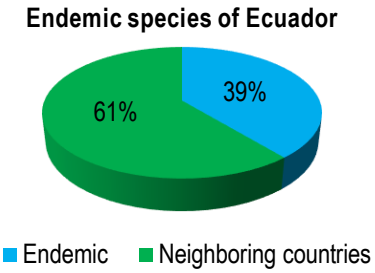
Fig. 2. Species threatened according to the IUCN.



Source: proper elaboration.

Among the 61 species of orchids and 5 hybrids reported, 61% are endemic to Ecuador, while the remaining 39% are mostly distributed in neighboring countries and in the region. (Fig.3)

Fig 3. Endemic orchid species of Ecuador.



Source: proper elaboration.

b) Evaluation of the cultural aspect component and aesthetic

Of the total registry of species (66) of orchids, species that were identified by their predominance and representativeness with potential for tourism in the different sampled areas and were valued of greater importance by taking into account biological criteria (threat situation and importance biological of the species and abundance), aesthetic (attributes of beauty and pleasure towards the community) and cultural (social conception or worldview that exists around the species) being defined with some significant attribute within the area (Table 1). These criteria were provided by the inhabitants of the community (12 informants) who affirmed the description of the attributes by means of an evaluation scale by attribute.

What most attracts the tourists' attention is the shape of the flowers, colors and aromas. It should be noted that several species were found that could not be correctly identified because they were not observed with flowers during the investigation process. Orchids, in the sampled areas, present important resources of wealth, to develop a tourism offer of a highly differentiated nature, through interpretive routes and paths, these species being flashy for ecotourism activity arousing interest for the visitor motivating their visit.

The knowledge of residents and tourists about the use of orchids with the potential to become important tourist attractions. Kala (2015) highlighted how medicinal and aromatic plants can create business opportunities particularly in the tourism sector. For example, Cheng et al., (2012), expose the different tourist activities related to plants from the point of view of marketing, planning, entrepreneurship and development.

Description of the attributes of striking orchids for tourists

Phragmipedium longifolium (Warsz. &Rchb. f.) Rolfe

Spectacular species for its shape with greater predominance in the coast and the Ecuadorian highlands.

Cattleya maxima Lindl.
It is cultivated as ornamental.

A striking species due to the color of its flowers and their shapes. Inflorescences of three to eight huge flowers (15 to 20 cm in diameter bright pink).

Erycina pusilla (Rchb.f.) N.H. Williams & M.W. Chase

Ornamental species, with a size of 5 to 6 cm, has flattened leaves arranged in a fan. It blooms in the months of June to August and its flower lasts about a week.

Gongora grossa Rchb. f.

It is an epiphytic herb, which grows in disturbed areas and cocoa crops, and orange was observed that grows on a Pechiche tree (Vitex gigantea) used as an ornamental plant in an accommodation site mainly in rural cabins.

Notylia rimbachii Schltr.

La hierba epifita, es una planta con propiedades medicinales, utilizada como antiinflamatorio, esta útil propiedad la convierte en una especie con potencial para ser utilizada como medicina natural en varias comunidades alejadas de los centros de población.

Trichocentrum tigrinum Linden & Rchb.f.

Striking species for its colors and aroma that has this orchid of lasting flower, with which it can be observed by various groups of tourists when they visit in area.

Dendrobium hibrido

Species of striking orchid by its flower buds are grouped into short clusters with one or two terminal flowers, which sprout from the stem in front of the leaves.

Sobralia powellii

Flaming species because of its thick, accumulated leaves that bloom in a sessile, terminal, cone-shaped inflorescence, successively with a single flower, with imbricated, dark and scabrous floral bracts and with very large flowers.

Zelenkoa onusta (Lindl.) M.W.Chase & N.H.Williams

Small orchid species with ovoid, longitudinal and ribbed conical pseudobulbs, grayish green with purple spots. The inflorescence is racemosa, with few or many fragrant lasting flowers.

Epidendrumbracteolatum (C.Presl)
Madsen et al. 2001

Epiphytic grass, locally known as weld with solder as well as several species of Catasetum. It is an emblematic species for the city of Guayaquil since 2004. It presents elongated pseudobulbs, leaves in pairs or in three groups, mainly white and yellow flowers.

Source: proper elaboration. **Photo by:** Adrian Sanchez

The importance of orchids for the development of tourism lies in the fact that they allow the integration of educational and conservation activities, based on the direct contact of visitors with the environment, the dissemination of conservation values and knowledge through a central thematic axis, in this In the case of orchids, it is important to take into account the following strategies, which could be implemented to promote tourism in selected locations in the province of Manabí, which entails the creation of new products or services, the management of new work profiles and the marketing development.

It can be done through: a) training for all sectors, workers and population benefited by tourism in conservation of biological diversity, b) creation and promotion of new tourism products and destinations with high species diversity, c) articulate an attractive and competitive offer that allows to enhance the current ecotourism offer, by adding value to the observation of orchids, d) creation of a unique brand for the observation of orchids in the province, e) promotional actions on the sustainable use and management of species.

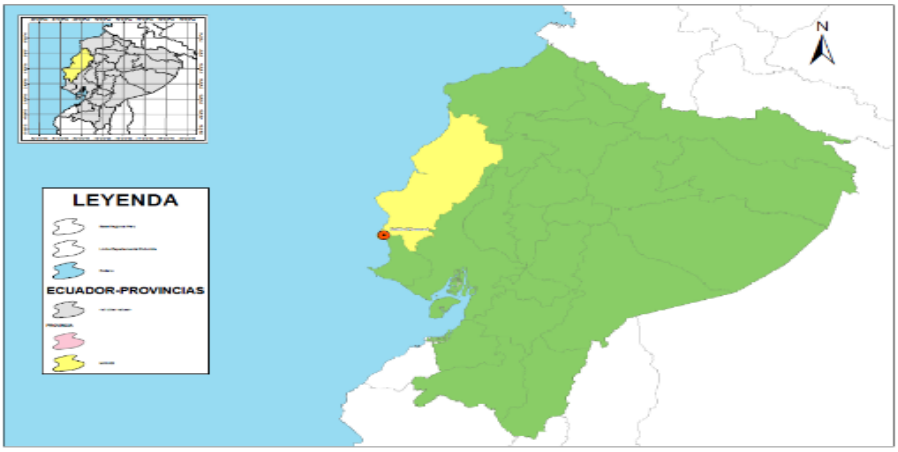
To achieve these results as suggested by Martinez Pérez et al. (2013) it is necessary the participation of rural communities within the conservation plans, and planning of the areas, since they are a fundamental part for in situ conservation and ex situ and have a close relationship with the natural environment, through cultural-environmental education in communities through workshops and circles of interest, which allow the population to have a command of the natural biological processes that characterize these species.

A potential activity to develop within the sampled and visited areas is interpretive hiking under the guidelines proposed by Thome-Ortiz, Tejeda- Sartorius, Tellez Velasco, & Torres Rivera (2017), incorporating activities such as flora observation, photographic, reproduction and display of orchids in their natural environment, allowing the observation of the growth and flowering of the orchids, and in turn complementing other tourist activities found in the area such as: sighting of wildlife, cultural and gastronomic tourism, rural tourism and ecotourism, among others.

Additionally, it is necessary to articulate the institutions involved either directly or indirectly in conservation processes such as Universities, Communities and Institutions of the State as Botanical Gardens that allow the diffusion of values of conservation and protection of these biological resources, maintaining communication, the collaboration and working together (Rozo Mora, Castellanos Castro, & Romero, 2017).

No current statistics on this market segment based on orchids have been obtained, but in recent years' tourism activity has increased in several countries and especially Ecuador, explained in large part by the growing interest in so-called nature oriented tourism. Emphasizing natural tourism, community tourism, cultural tourism, adventure, ecotourism and agrotourism. In this context, knowledge of tourism demand acquires special relevance within the tourism industry, and orchids become a potential tourist attraction strategy based on the natural resource, promoting a well-structured tourist offer that motivates the movement of different tourist segments. For this, it is necessary to develop an ecotourism circuit that combines different products related to orchids such as trails, interpretive centers, specialty stores, nurseries, special events and courses in the province of Manabí-Ecuador.

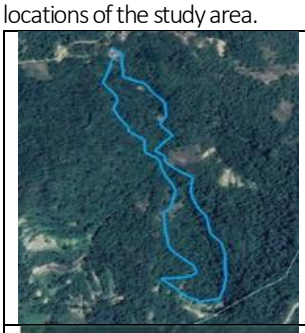
Fig 4. Location of the province of Manabí.



Source: Own elaboration, thought ArcGis.

The tourist routes with a good infrastructure allow the organization to fulfill its function of facilitating the recreation of the tourists in the natural space. The employability of routes is of vital importance because it allows the integration of educational and conservation activities with tourism, through direct contact with tourists and the receiving community, below are four routes applicable to the study locations for their use of the natural resources that each of them possess.

Fig 5. Routes that can be implemented in the different locations of the study area.

	Route(a) Elevation min. 283 masl, elevation max. 515 masl, duration 2h:55
	Route (b) Elevation min. 312 masl, elevation max. 533 masl, duration 3h:35
	Route (c) Elevation min. 357 masl, elevation max. 591 masl, duration 4h:05
	Route(d) Elevation min. 235 masl, elevation max. 424 masl, duration 5h:05

Source: Own elaboration, through Google Earth.

The information provided to them is of enriching knowledge of orchids, promoting the importance of these species, allows to recover the meanings of the cultural, aesthetic aspects of the natural heritage, through the experience of observing the natural wealth of the different areas in which routes are used.

The recreational use of natural resources has become evident through tourism activities that involve the collection and contemplation of the different elements of the landscape, Thomé et al., 2017. Such is the case of the collection circuits of wild edible plants in Asia (Chen and Qiu, 2012; Dweba and Merans, 2011), the link between hiking and wild edible fungi (Thomé et al., 2015) and the specific case of orchideological trails (Kirby, 2003; Pickering and Ballantyne, 2013; Baltazar et al., 2014).

5 CONCLUSIONS

This article assessed the potential to link with the orchid market and the global interest in their conservation with development projects in adjacent communities. Developing the market capacity of orchids as a product in this region would help to achieve two common objectives that were emphasized in national and international policy discussions: "increase living standards among the poor and conserve natural resources." (Cuoco and Cronan, 2009).

The methodological strategy of this research was to present a proposal for the creation of an orchid route in order to conserve especially those vulnerable species and those that are in danger of extinction within the sampled areas, in order to meet the expectations of the target market of Orchid fans.

This research identified 61 species of orchids and five hybrids in the Manabí province belonging to 41 different genders, with potential for use in tourism activities taking into account the biological, aesthetic and cultural criteria, some of them very representative and of great botanical and scientific importance within the study areas, for which it is important to promote responsible management practices and reduce extraction rates of wild population.

The use of orchid species in routes and interpretive trails as a management model, integrating education and conservation through the observation of orchids in natural areas, allows the maintenance of the species, promoting their dissemination in the Manabí province. In the same way, it is important to promote strategic lines of conservation linked to nature tourism, which encourage the integration of communities in the conservation of orchids, creating new employment alternatives, raising the level of environmental culture and consequently the quality of life in the population, through training and training of local guides.

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Appendix – Types of orchids identified.

Nº	Género	Nombre científico	Hábito	Área de ubicación	Endemismo	Presencia en SNAP	IUCN	CITES
1	*Anathallis*	*Anathallis pachyphyta* (Luer) Pridgeon & M.W.Chase	Epífita	PNM (Sendero El Rocío)	x	x	VU	II
2	*Arundina*	*Arundina graminifolia* (D. Don) Hochr.	Terrestre	Pacoche				II
3	*Benzingia*	*Benzingia estradae* (Dodson) Dodson ex Dodson	Epífita	Paja Luisa	x	x	VU	II
4	*Brassia*	*Brassia jipijapensis* Dodson & N. H. Williams	Epífita	Pisloy	x		EN	II
5		*Brassia warszewiczii* Rchb. f.	Epífita	Cerro Olina	x		VU	II
6	*Cattleya*	*Cattleya maxima* Lindl.	Epífita	Monte Oscuro				II
7		*Cattleya Hibrido*	Epífita	Las Guaijas				II
8	*Catasetum*	*Catasetum expansum* Rchb. F.	Epífita	San Lorenzo				II
9		*Catasetum macroglossum* Rchb. F.	Epífita, terrestre	Campozano				II

10	*Cyclopogon*	*Cyclopogon elliptica* (Garay) Dodson	Terrestre	Paja Luisa	x		NT	II
11		*Cyclopogon estradae* Dodson	Epífita, terrestre	Cerro Montecristi	x	x	EN	II
12	*Cyrtochiloides*	*Cyrtochiloides ochmatochila* (Rchb.f.) N.H.Williams & M.W.Chase	Epífita	El Aromo		x		II
13	*Dendrobium*	*Dendrobium Hibrido*	Epífita	Monte Oscuro				II
14		*Dendrobium Hibrido*	Epífita	Pisloy				II
15		*Dendrobium Hibrido*	Epífita	San Lorenzo				II
16		*Dendrobium Hibrido*	Epífita	Pisloy				II
17	*Dichaea*	*Dichaea morrisii* Fawc. & Rendle	Epífita	Rio Plátano		x		II
18	*Dimerandra*	*Dimerandra Rimbachii* (Schltr.) Schltr	Epífita	Pisloy	x	x	NT	II
19		*Dimerandra sp.*	Epífita	Cerro Olina				II
20	*Dracula*	*Dracula mopsus* (F. Lehm. & Kraenzl.) Luer	Epífita	Cerro Montecristi	x		VU	II
21	*Dryadella*	*Dryadella elata* (Luer) Luer	Epífita, litófita	Cerro Olina	x	x	VU	II
22	*Elleanthus*	*Elleanthus aristatus* Garay	Epífita	Paja Luisa	x		LC	II
23	*Encyclia*	*Encyclia angustiloba* Schltr.	Epífita	Pisloy	x		CR	II
24	*Epidendrum*	*Epidendrum iltisorum* Dodson	Epífita	Cerro Montecristi	x		CR	II
25		*Epidendrum aromoense* Cornejo & Hágsater	Epífita	El Aromo	x		EN	II
26		*Epidendrum bracteolatum* (C. Presl) Madsen et al. 2001	Epífita	Pisloy	x			II
27		*Epidendrum jativae* Dodson	Epífita	PNM (Sendero El Rocío)	x		VU	II
28		*Epidendrum macroophorum* Hagsater & Dodson	Epífita	Pacoche				II
29		*Epidendrum tenuicaule* F. Lehm. & Kraenzl.	Epífita	Rio Plátano	x		LC	II
30	*Erythrodes*	*Erythrodes ecuadorensis* Garay	Terrestre	PNM (Sendero El Rocío)	x	x	EN	II
31	*Erycina*	*Erycina pusilla* (L.) N.H.Williams & M.W.Chase	Epífita	Cerro Montecristi	x			II
32	*Gongora*	*Gongora grossa* Rchb. f	Epífita	Pacoche	x		VU	II
33	*Lepanthes*	*Lepanthes saltatrix* Luer & Hirtz	Epífita	Paja Luisa	x		VU	II
34	*Macroclinium*	*Macroclinium manabinum* (Dodson) Dodson	Epífita	Cerro Montecristi	x	x	CR	II
35	*Maxillaria*	*Maxillaria estradae* Dodson	Epífita	Cerro Olina	x	x	EN	II
36	*Notylia*	*Notylia replicata* Schltr.	Epífita	Las Guaijas	x		VU	II

37		*Notylia rimbachii* Schltr.	Epífita	Rio Plátano		x x	VU	II
38	*Oncidium*	*Oncidium estradae* Dodson	Epífita	PNM (Sendero El Rocío)	x		VU	II
39		*Oncidium riopalenqueanum* Dodson	Epífita	Rio Plátano	x		VU	II
40		*Oncidium mantense* Dodson & R. Estrada	Epífita	El Aromo	x		EN	II
41		*Oncidium stenotis* Rchb. f.	Epífita	El Aromo				II
42		*Oncidium sp.*	Epífita	PNM (Sendero El Rocío)		x		II
43	*Ornithocephalus*	*Ornithocephalus manabina* Dodson	Epífita	Campozano	x		EN	II
44	*Osmoglossum*	*Osmoglossum panduratum* Garay	Epífita	Paja Luisa	x		CR	II
45	*Pelexia*	*Pelexia olivacea* Rolfe	Epífita	Pacoche		x		II
46	*Pescatorea*	*Pescatorea wallisii* Linden & Rchb.	Epífita	Pisloy	x		NT	II
47	*Pleurothallis*	*Pleurothallis clavigera* Luer	Epífita	Cerro Montecristi	x		VU	II
48		*Pleurothallis henrici* Schltr	Epífita	PNM (Sendero El Rocío)	x		DD	II
49		*Pleurothallis quadriserrata* Luer	Epífita	Cerro Olina	x		EN	II
50	*Phragmipedium*	*Phragmipedium longifolium* (Warsz. & Rchb. f.) Rolfe	Terrestre	Pisloy			LC	I
51	*Prosthechea*	*Prosthechea sp.*	Epífita	Pisloy				II
52	*Psychopsis*	*Psychopsis krameriana* (Rchb. f.) H.G. Jones	Epífita	Pacoche		x	VU	II
53	*Rodriguezia*	*Rodriguezia strobelii* Garay	Epífita	PNM (Sendero El Rocío)	x	x	EN	II
54	*Scaphyglottis*	*Scaphyglottis modesta* (Rchb.f.) Schltr.	Epífita	Rio Plátano		x		II
55		*Scaphyglottis prolifera* (R.Br.) Cogn.	Epífita	Paja Luisa		x		II
56	*Stanhopea*	*Stanhopea frymirei* Dodson	Epífita	Cerro Olina	x	x	EN	II
57	*Stelis*	*Stelis acicularis* Luer	Epífita	Cerro Montecristi	x		CR	II
58		*Stelis manabina* Dodson & Garay	Epífita	Cerro Montecristi	x	x	VU	II
59		*Stelis sp.*	Epífita	PNM (Sendero El Rocío)		x		II
60	*Sobralia*	*Sobralia powellii*	Epífita	Cerro Olina		x		II
61		*Sobralia gentryi* Dodson	Epífita	Pacoche	x		VU	II
62	*Trichocentrum*	*Trichocentrum tigrinum* Linden & Rchb.f.	Epífita	PNM (Sendero El Rocío)		x		II
63		*Trichocentrum sp.*	Epífita	Pisloy				II
64	*Trichopilia*	*Trichopilia rostrata* Rchb	Epífita	Paja Luisa	x		NT	II

65	*Zelenkoa*	*Zelenkoa onusta* (Lindl.) M.W.Chase & N.H.Williams	Epífita	Pisloy				II
66	*Zygostates*	*Zygostates apiculata* (Lindl.) Toscano	Epífita	Cerro Montecristi	x			II

Source: proper elaboration.

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