Interactive taxonomic key for identification of urban trees in Belo Horizonte, Minas Gerais, Brazil

Flávia Faria, Ariadne Lopes & João Renato Stehmann

INTRODUCTION

The Natural History Museum and Botanical Garden of the Federal University of Minas Gerais (MHNJB/UFMG) has a 60 hectare forest reserve, where 30 trees species are used in urban forestry in Belo Horizonte (Minas Gerais, Brazil) can be found.

Trail in the forestry reserv

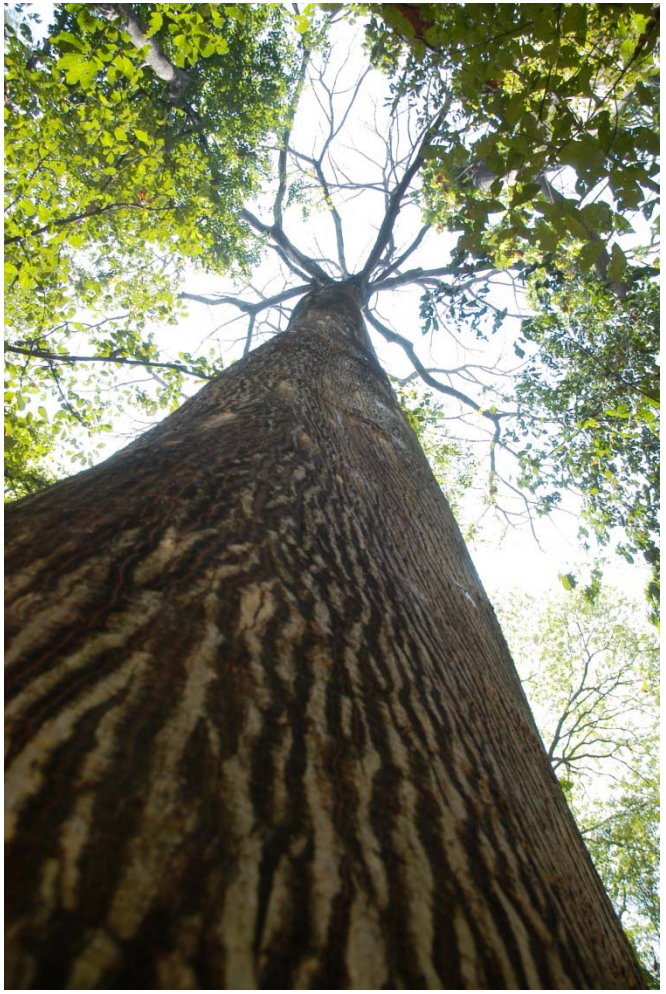
Lake in the forestry reserv

INTRODUCTION

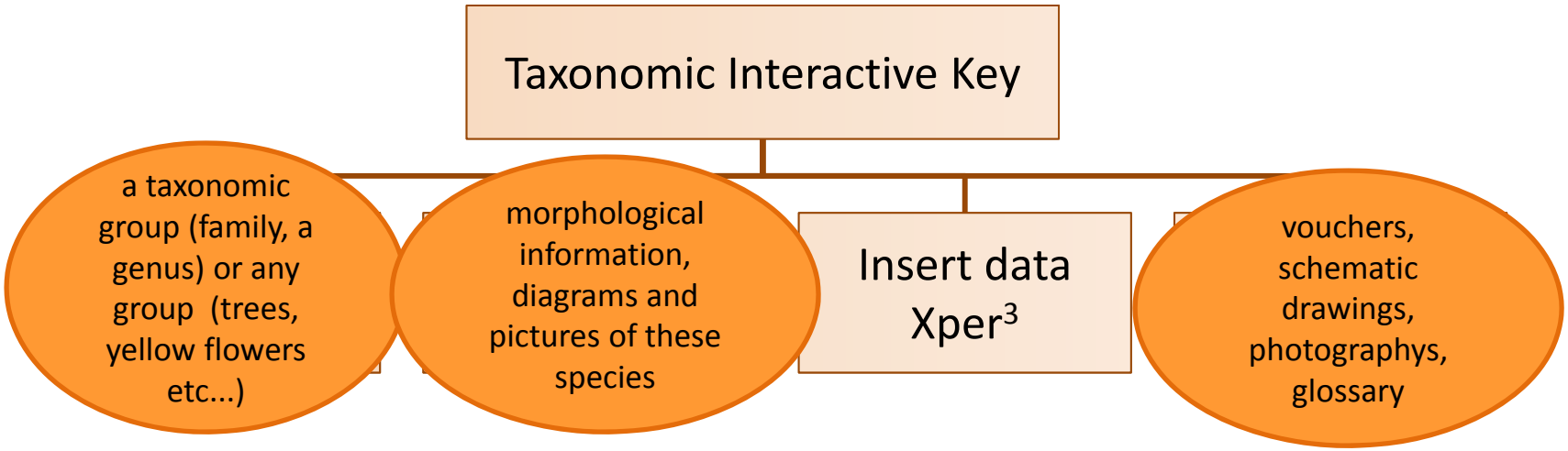
The urban trees have great importance for the urban ecosystem and the quality of human life. For many people in the big cities, the only interaction with plant species occurs through the contact with the urban trees.

OBJECTIVE

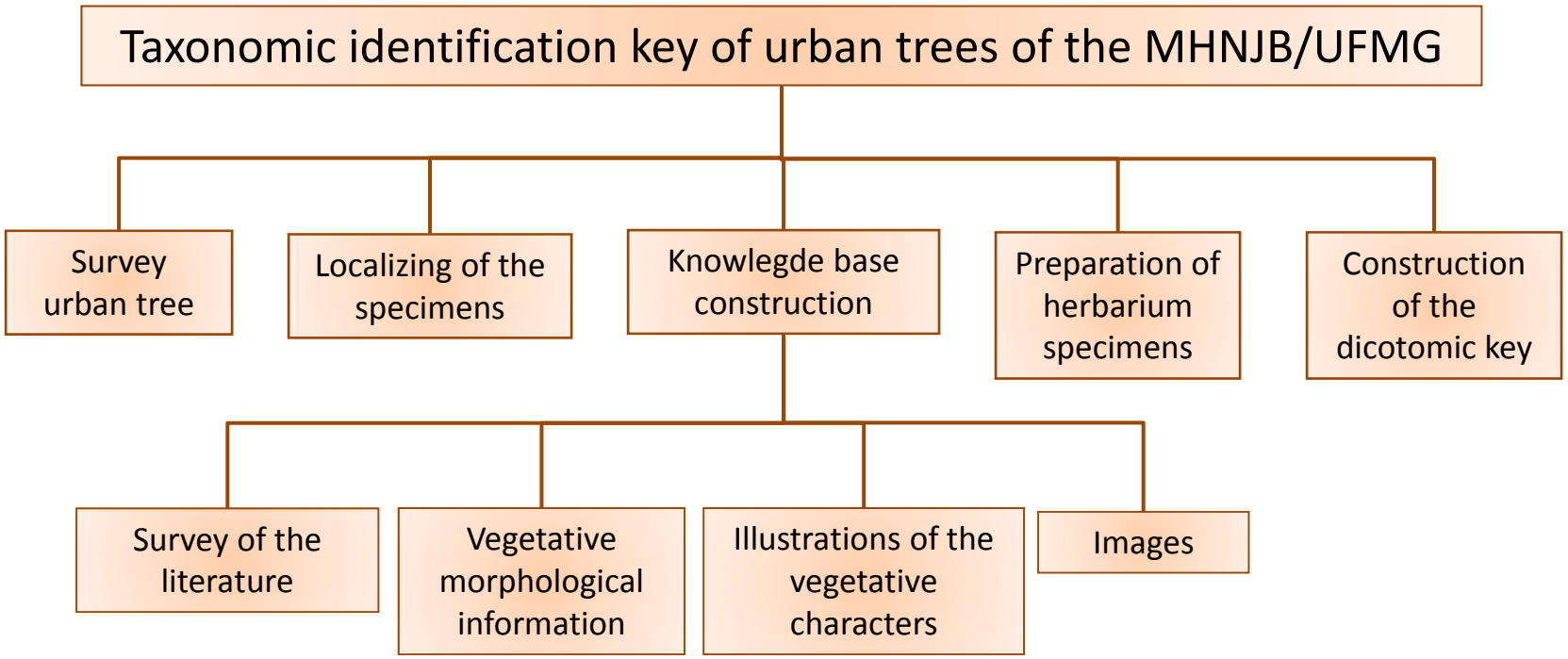
The aim of this activity is to promote the interest and the enchantment of the general public for plants as well as to encourage teachers to use the teaching material of the project with their students, encouraging them to know and to value our natural heritage.



How to make a taxonomy interactive key

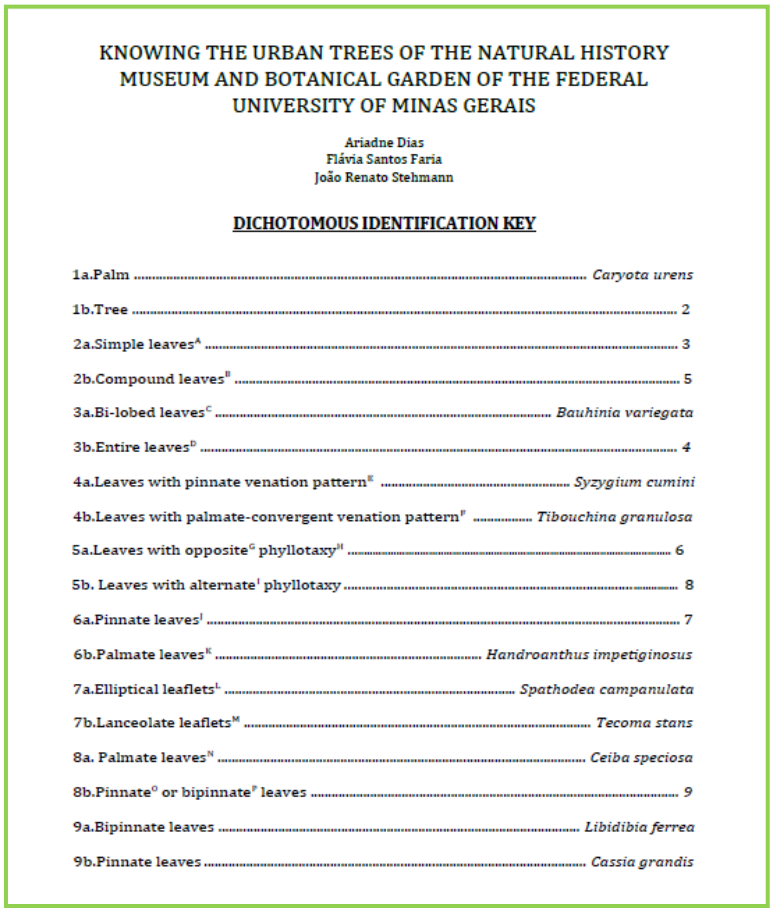


HOW TO MAKE A TAXONOMIC INTERACTIVE KEY



RESULTS

- An interactive key for 30 species of Belo Horizonte urban trees;
- Development of teaching material to be used in workshops.



KNOWING THE URBAN TREES OF THE NATURAL HISTORY MUSEUM AND BOTANICAL GARDEN OF THE FEDERAL UNIVERSITY OF MINAS GERAIS

Ariadne Dias
Flávia Santos Faria
João Renato Stehmann

DICHOTOMOUS IDENTIFICATION KEY

1a.Palm ..... *Caryota urens*

1b.Tree 2

2a.Simple leaves[A] 3

2b.Compound leaves[B] 5

3a.Bi-lobed leaves[C] ..... *Bauhinia variegata*

3b.Entire leaves[D] 4

4a.Leaves with pinnate venation pattern[E] ..... *Syzygium cumini*

4b.Leaves with palmate-convergent venation pattern[F] ..... *Tibouchina granulosa*

5a.Leaves with opposite[G] phyllotaxy[H] 6

5b. Leaves with alternate[I] phyllotaxy 8

6a.Pinnate leaves[J] 7

6b.Palmate leaves[K] ..... *Handroanthus impetiginosus*

7a.Elliptical leaflets[L] ..... *Spathodea campanulata*

7b.Lanceolate leaflets[M] ..... *Tecoma stans*

8a. Palmate leaves[N] ..... *Ceiba speciosa*

8b.Pinnate[O] or bipinnate[P] leaves 9

9a.Bipinnate leaves ..... *Libidibia ferrea*

9b.Pinnate leaves ..... *Cassia grandis*

RESULTS

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- Development of teaching material to be used in workshops.

ILLUSTRATED GLOSSARY

DIVISION OF THE BLADE

Fig. 1 – Simple

Fig. 2 – Compound

TYPES OF SIMPLE LEAVES

Fig. 3 – Bi-lobed

Fig. 4 – Entire

VENATION

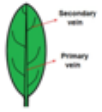

Fig. 5 – Pinnate

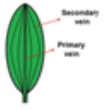

Fig. 6 – Palmate-convergent

PHYLLOTAXY

Fig. 7 – Opposite

Fig. 8 – Alternate

[A]**SIMPLE LEAF:** The leaf blade is not divided into leaflets (Fig. 1).

[B]**COMPOUND LEAF:** The leaf blade is divided into several small parts, known as leaflets (Fig. 2).

[C]**BI-LOBED LEAF:** The leaf has two lobes equally rounded (Fig. 3).

[D]**ENTIRE LEAF:** The leaf does not have any division (Fig. 4).

[E]**PINNATE VENATION PATTERN:** The leaf has only one principal vein (primary vein) that gives off many lateral veins (secondary veins) [Fig. 5].

[F]**PALMATE-CONVERGENT VENATION PATTERN:** Many secondary veins arising from the tip of the petiole. At the base of the leaf they are closely arranged but diverge from the others in the middle part and converge towards the apex of the leaf (Fig. 6).

[G]**OPPOSITE PHYLLOTAXY:** There are two leaves per node that stand opposite each other (Fig. 7).

[H]**PHYLLOTAXY:** It is the arrangement of the leaves on a plant stem.

[I]**ALTERNATE PHYLLOTAXY:** There is one leaf per node (Fig. 8).

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TYPES OF COMPOUND LEAVES

Fig. 9 – Pinnate

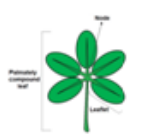

Fig. 10 – Palmate

LEAFLET SHAPE

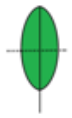

Fig. 11 – Eliptical

Fig. 12 – Lanceolate

TYPES OF COMPOUND LEAVES

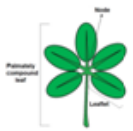

Fig. 13 – Palmate

Fig. 14 – Pinnate

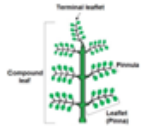

Fig. 15 – Bipinnate

[J]**PINNATE LEAF:** The leaf is divided into leaflets that are attached along an extension of the stem (Fig. 9).

[K]**PALMATE LEAF:** More than two leaflets are attached on the upper end of the petiole, coming from the same point (Fig. 10).

[L]**ELLIPTICAL SHAPE:** Ellipse-shaped leaflets. The larger length is twice the width (Fig. 11).

[M]**LANCEOLATE SHAPE:** Lance-head-shaped leaflets. The length is twice or three times the large width (Fig. 12).

[N]**PALMATE:** more than two leaflets are attached on the upper end of petiole, in the same point (Fig. 13).

[O]**PINNATE LEAF:** More than two leaflets are attached on the upper end of the petiole, coming from the same point (Fig. 14).

[P]**BIPINNATE LEAF:** The leaf is divided into leaflets that are attached along an extension of the stem (Fig. 15).

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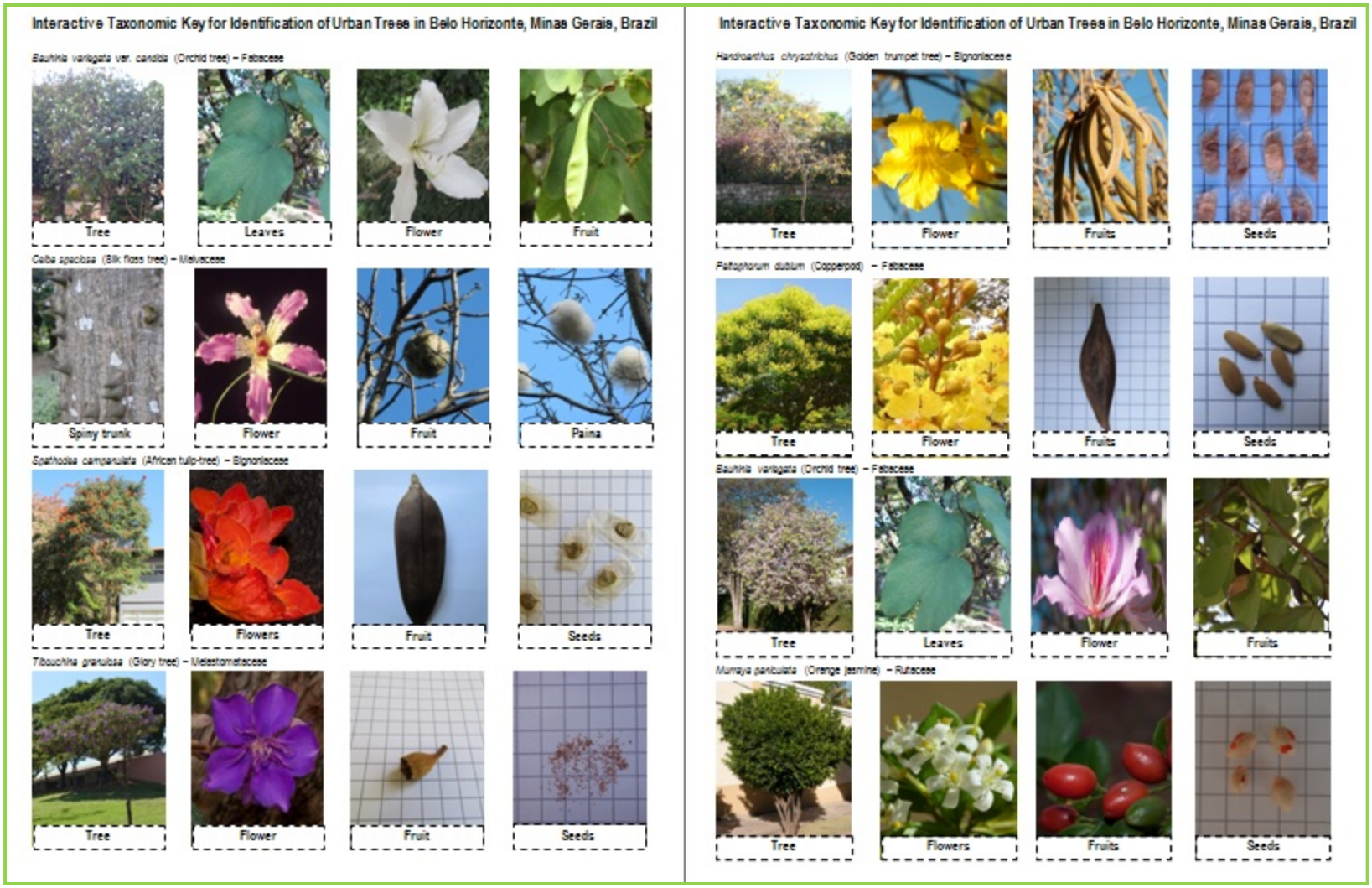
RESULTS


Interactive Taxonomic Key for Identification of Urban Trees in Belo Horizonte, Minas Gerais, Brazil
Bauhinia variegata var. candida (Orchid tree) – Fabaceae
Tree
Leaves
Flower
Fruit
Ceiba speciosa (Silk floss tree) – Malvaceae
Spiny trunk
Flower
Fruit
Palma
Spathodea campanulata (African tulip-tree) – Bignoniaceae
Tree
Flowers
Fruit
Seeds
Tibouchina granulosa (Glory tree) – Melastomataceae
Tree
Flower
Fruit
Seeds
Interactive Taxonomic Key for Identification of Urban Trees in Belo Horizonte, Minas Gerais, Brazil
Handroanthus chrysotrichus (Golden trumpet tree) – Bignoniaceae
Tree
Flower
Fruits
Seeds
Peltophorum dubium (Copperpod) – Fabaceae
Tree
Flower
Fruits
Seeds
Bauhinia variegata (Orchid tree) – Fabaceae
Tree
Leaves
Flower
Fruits
Murraya paniculata (Orange jasmine) – Rutaceae
Tree
Flowers
Fruits
Seeds

RESULTS

RESULTS

RESULTS

- 5 workshops were realized (50 participants).

CONSIDERATIONS

- The interactive key is a good and simple strategy to learn about the plants;

- Xper² is a powerful tool for editing and managing taxonomic descriptions. Freely download your Windows™, Mac™ or Linux version in French, English or Spanish.

CONSIDERATIONS

- This can be an itinerant activity, since internet signal exists;

- People have demonstrated a big interest in the activity. They have related that the workshop has contributed for their knowledge;

- Some participants have complained about the short time of the workshop (2 hours). For this reason we intend to transform it in a basic course of introduction to plant identification.

TUTORIAL XPER^3

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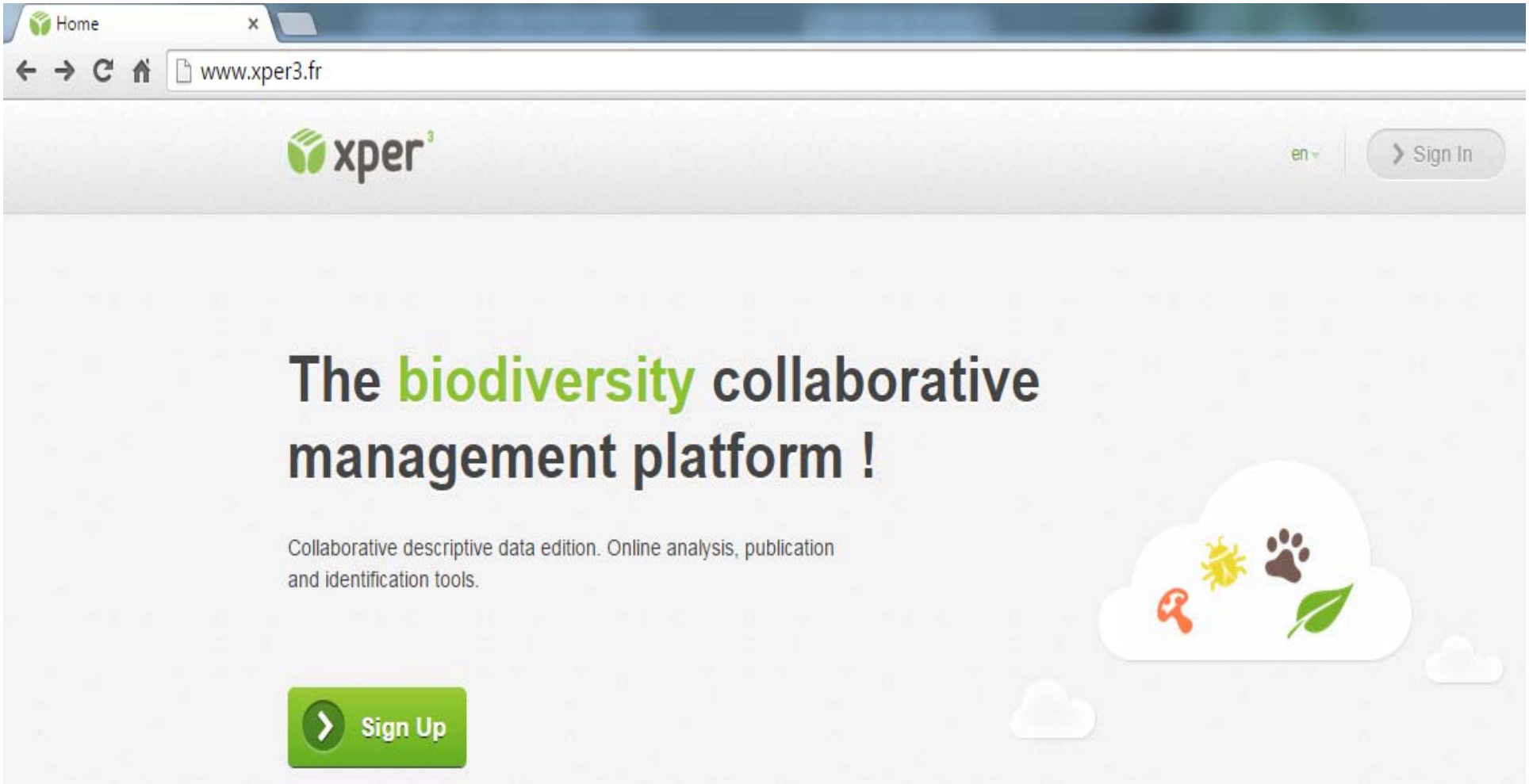

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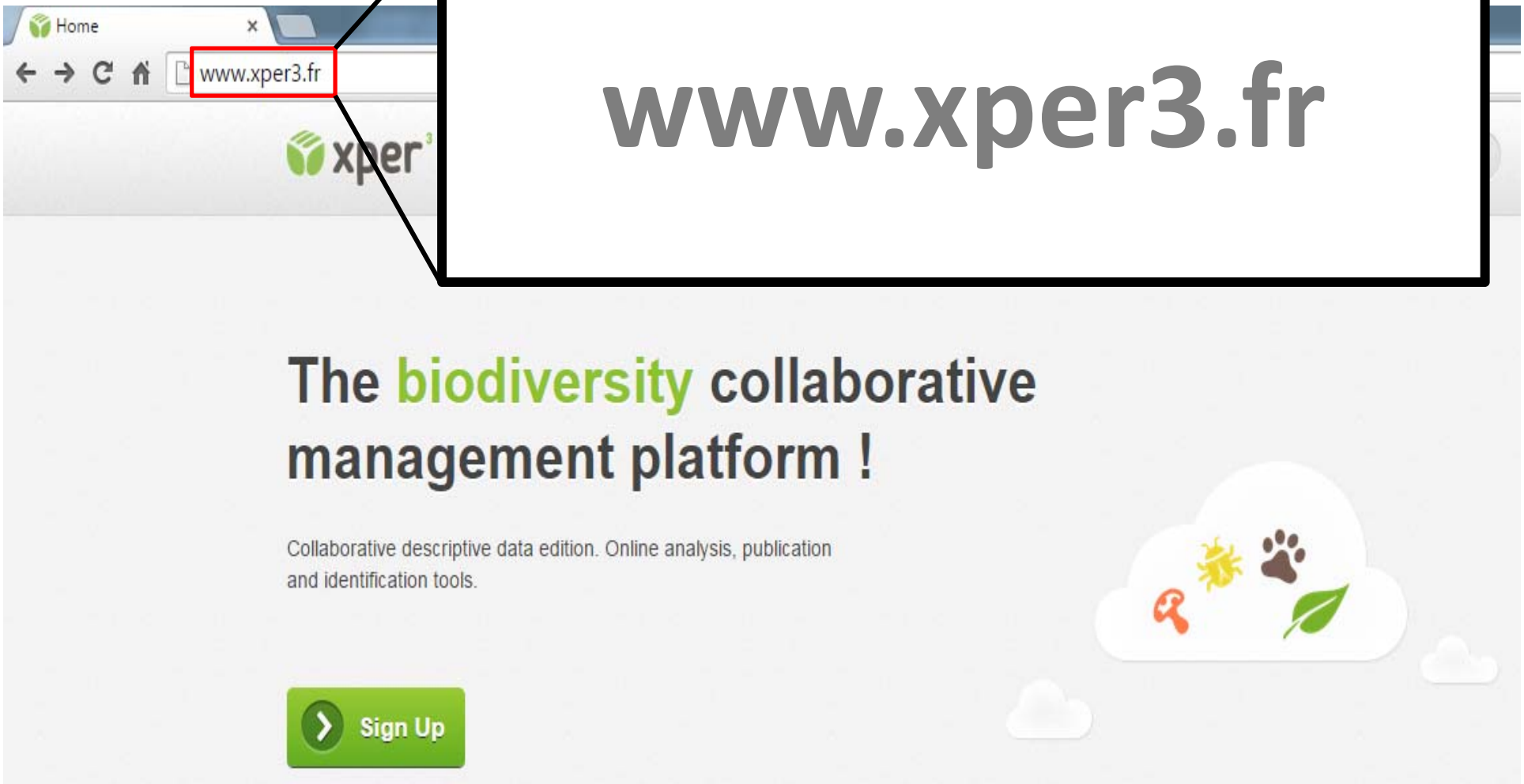

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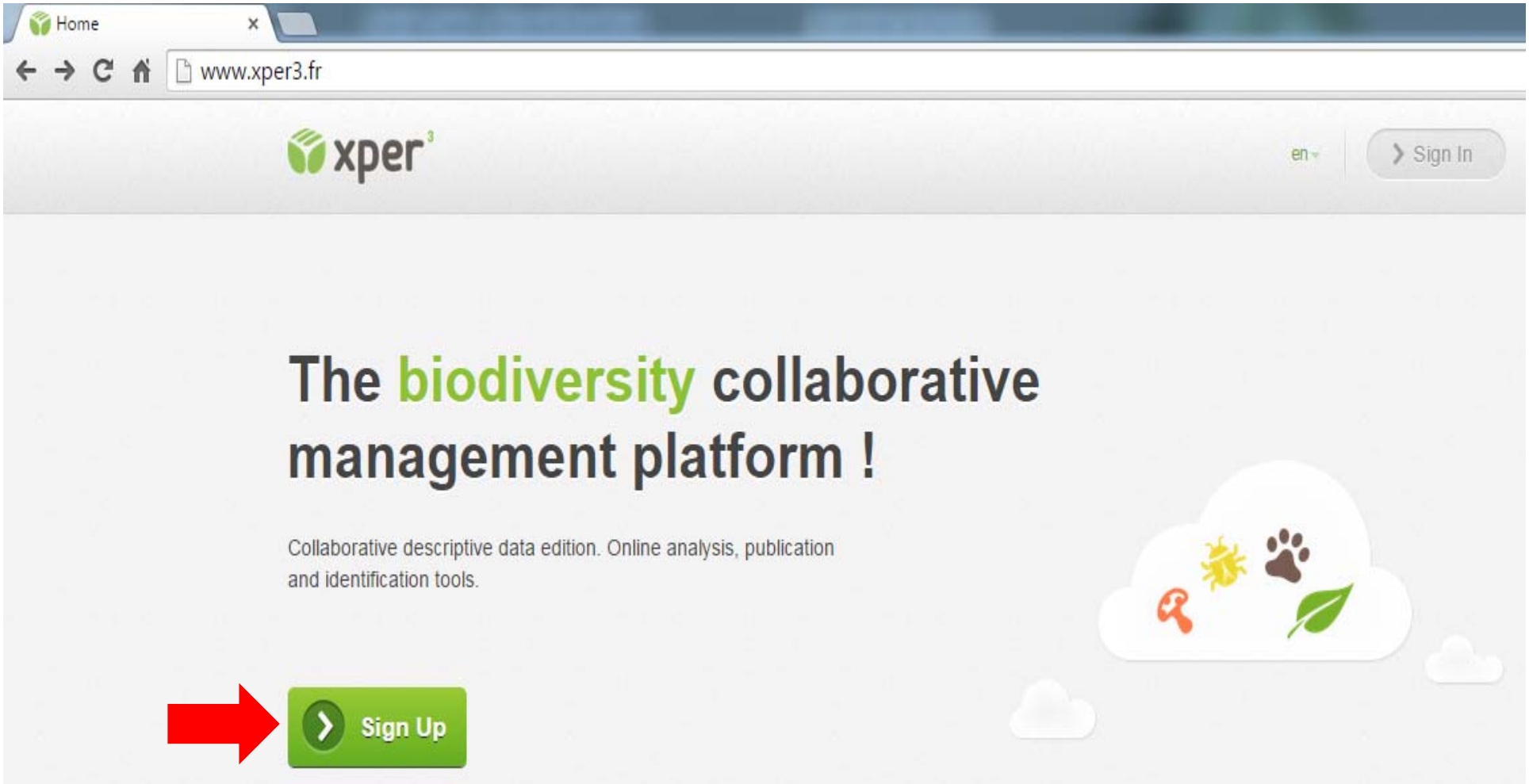

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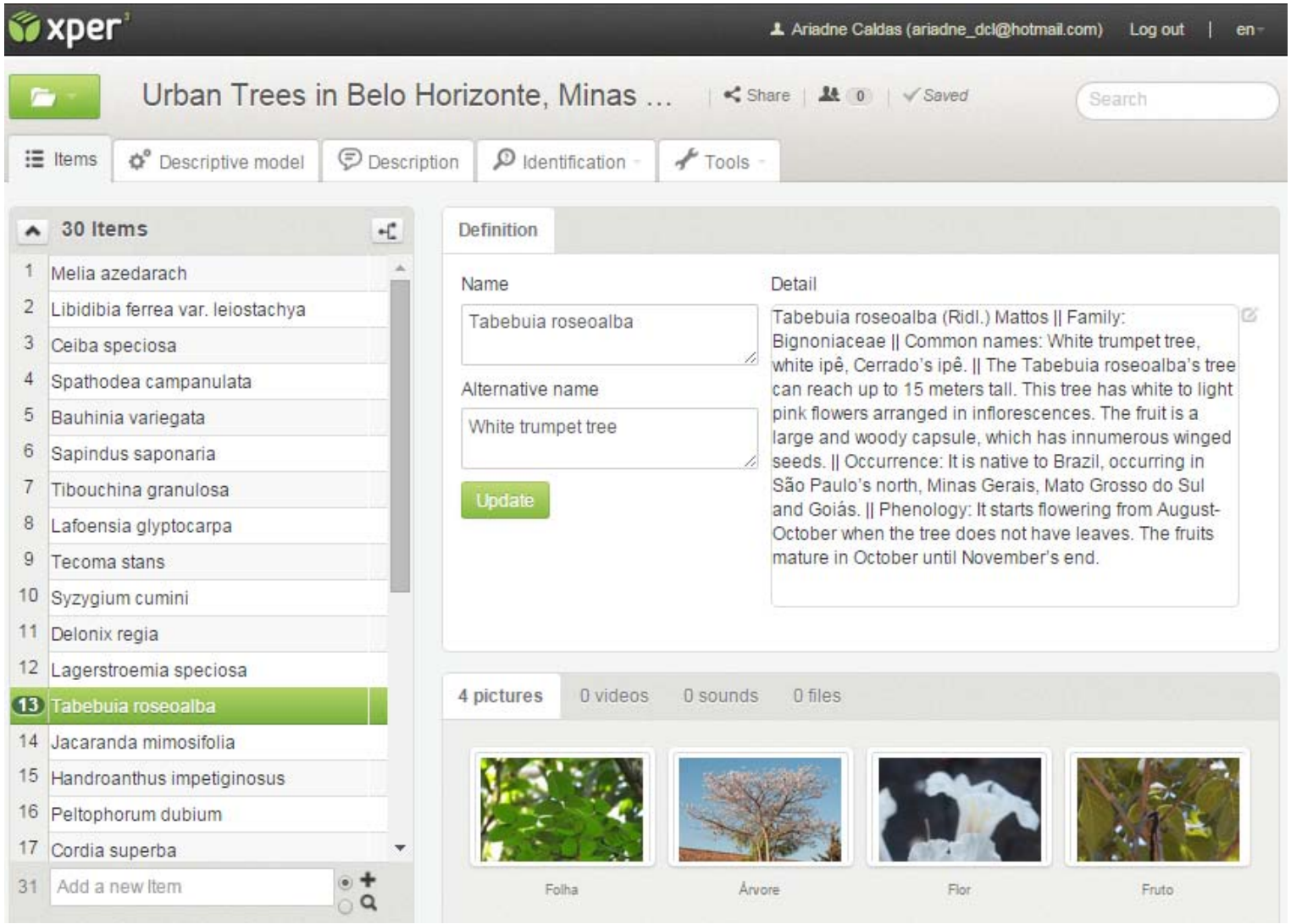

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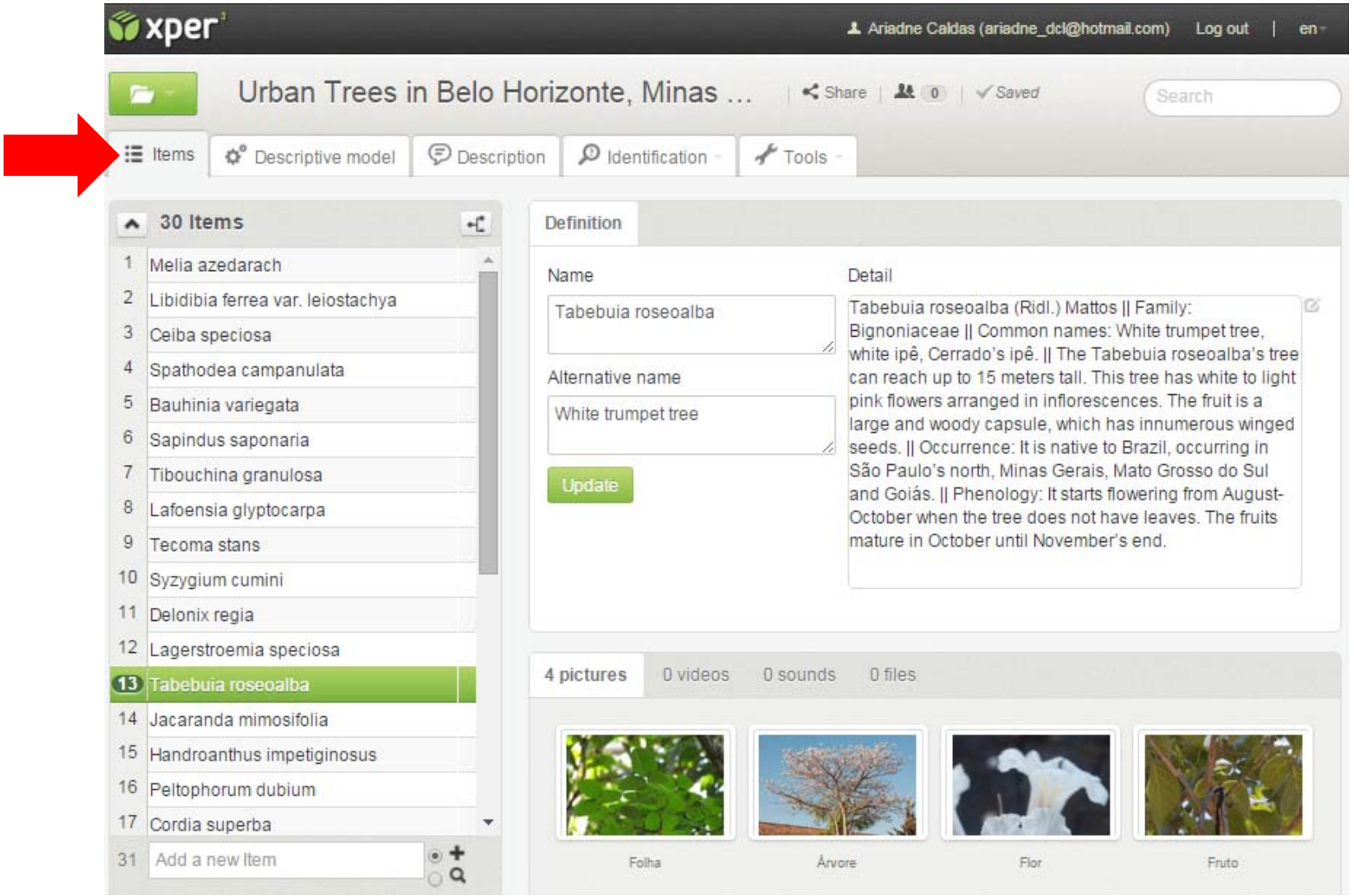

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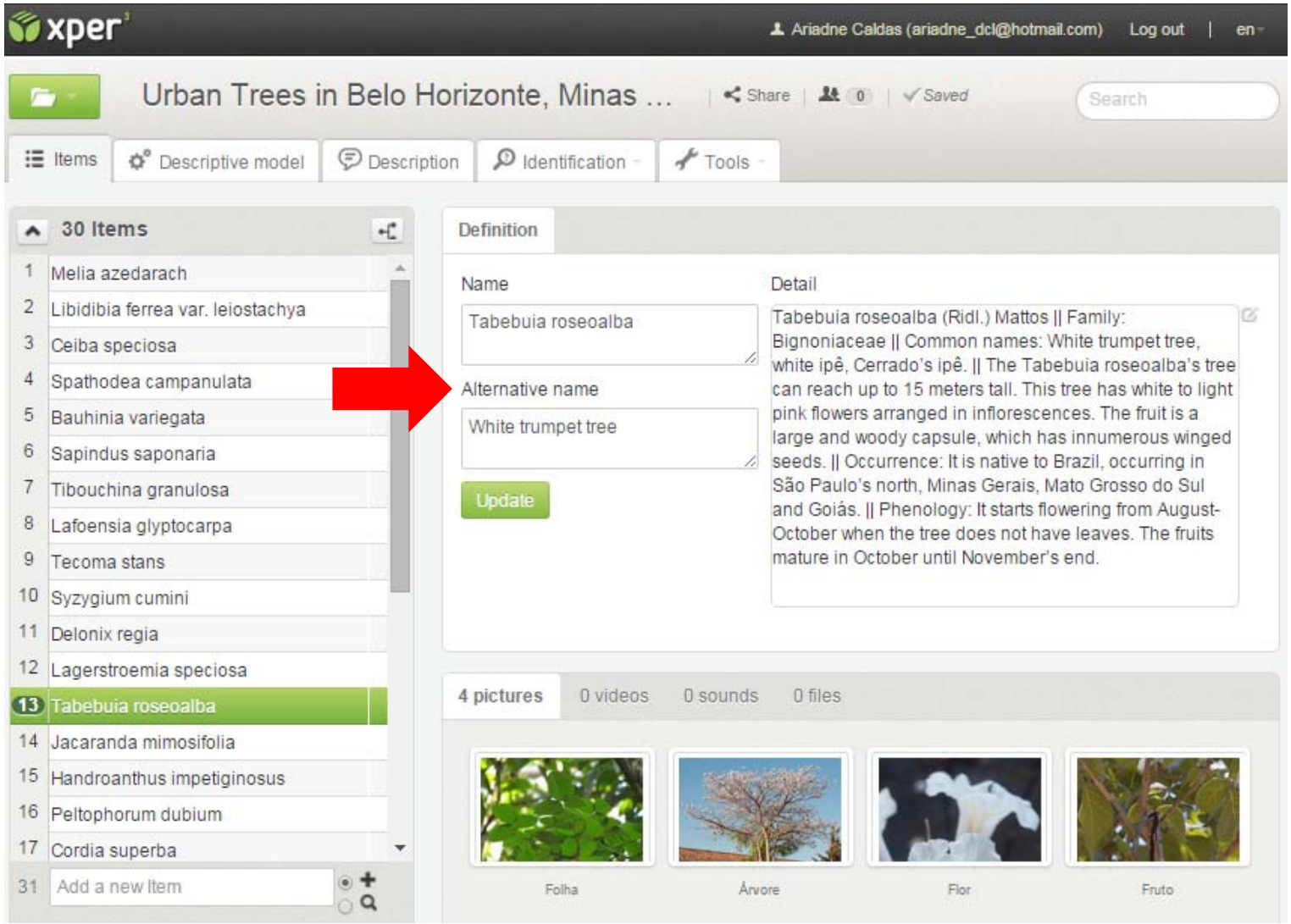

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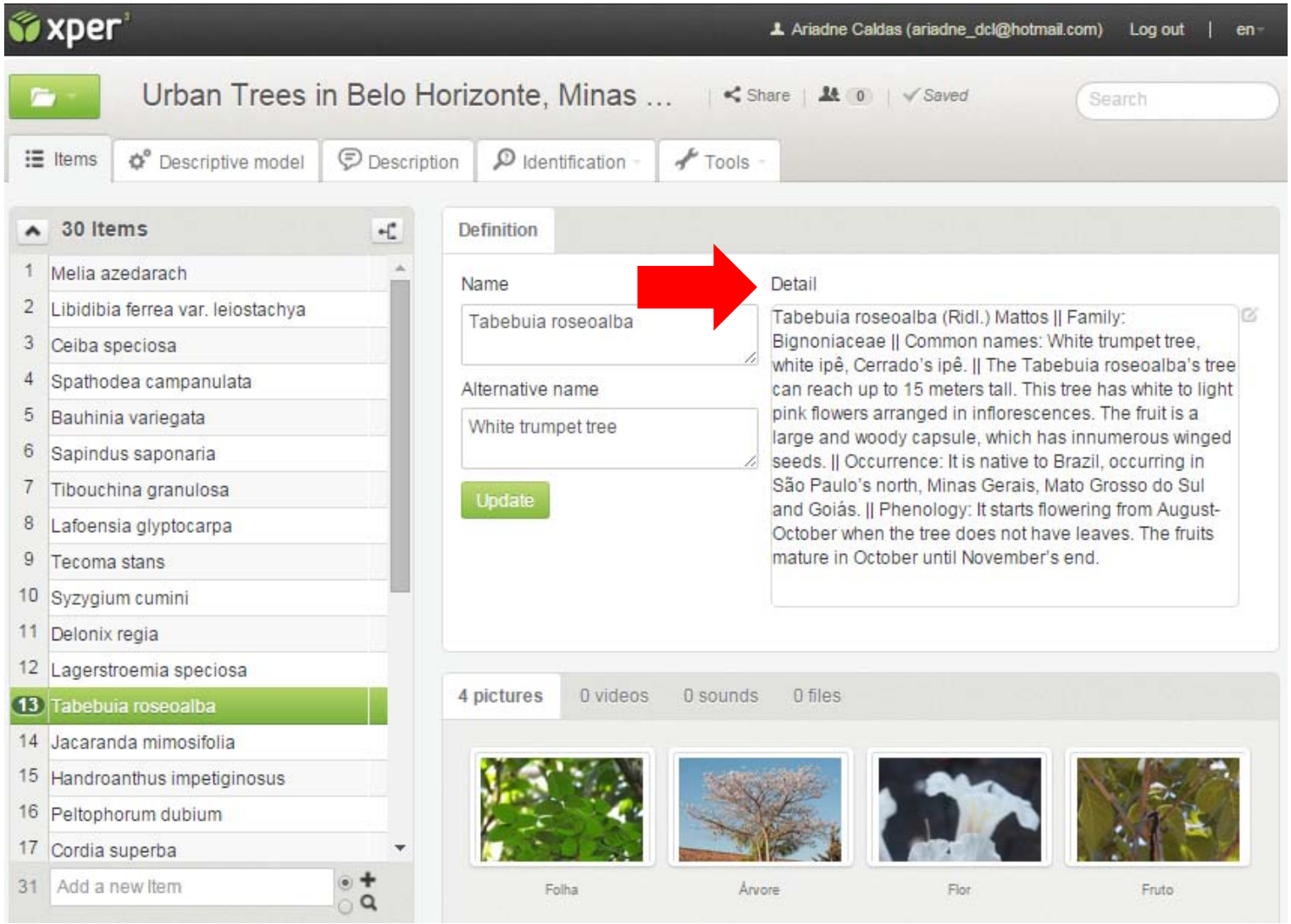

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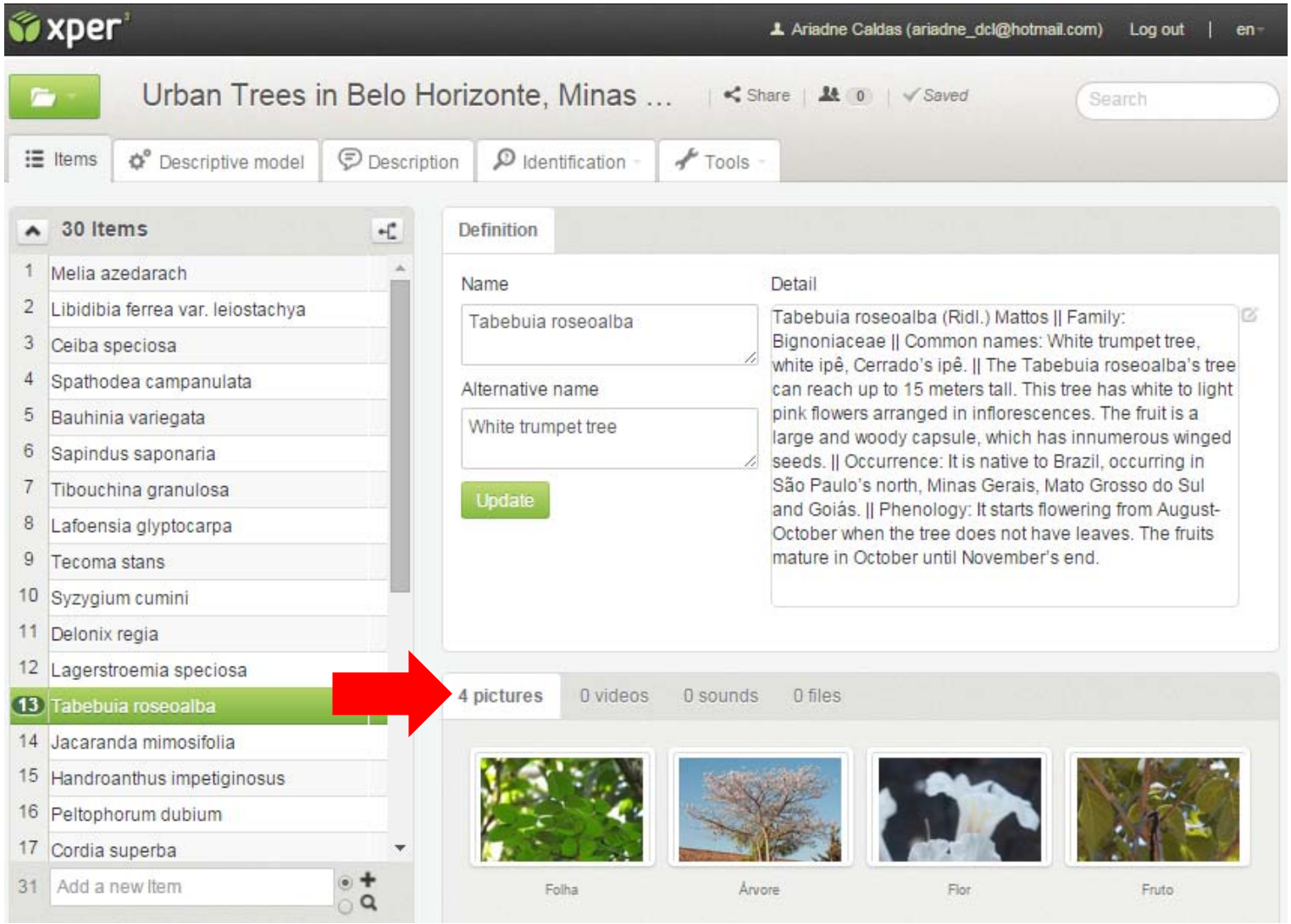

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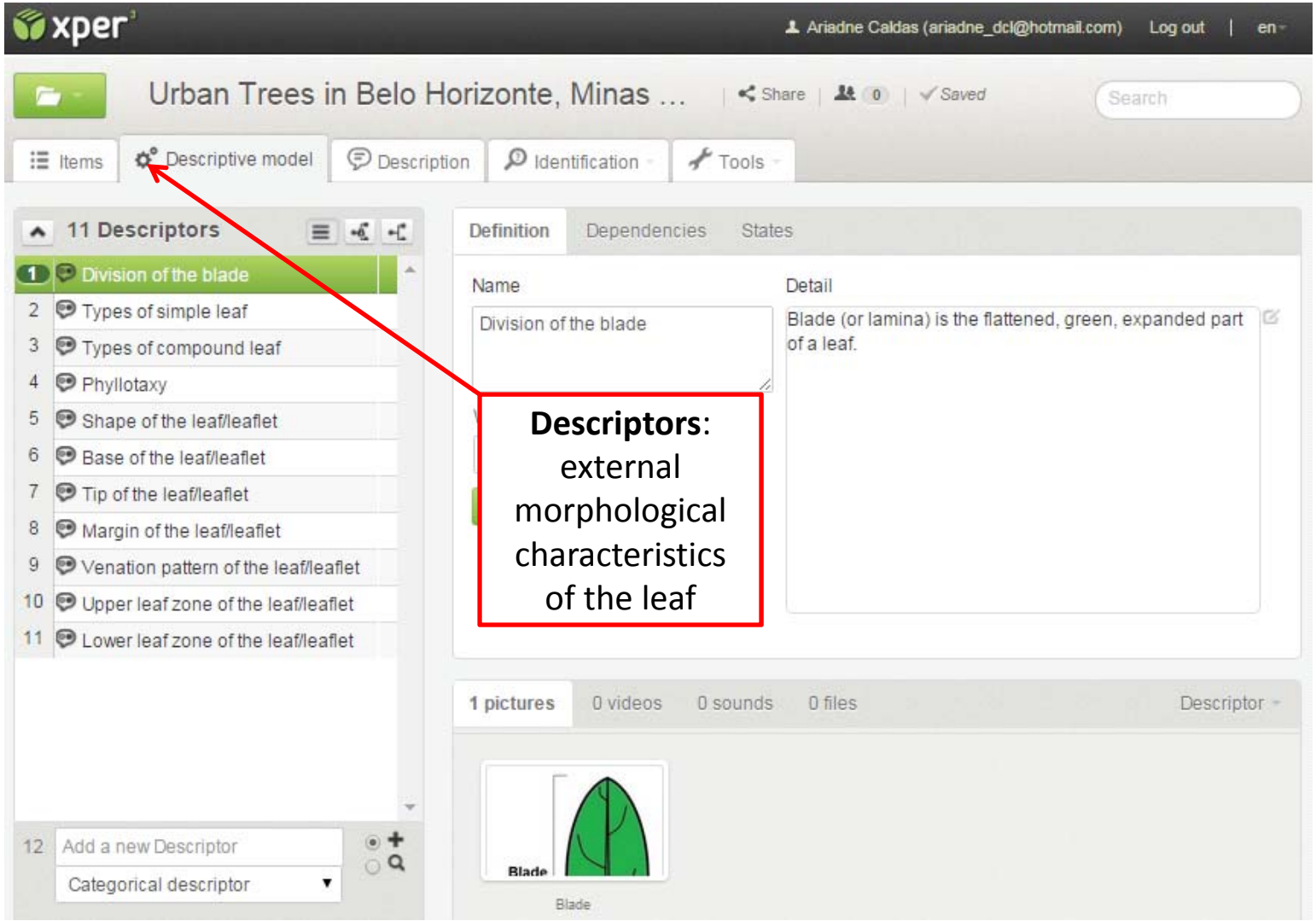

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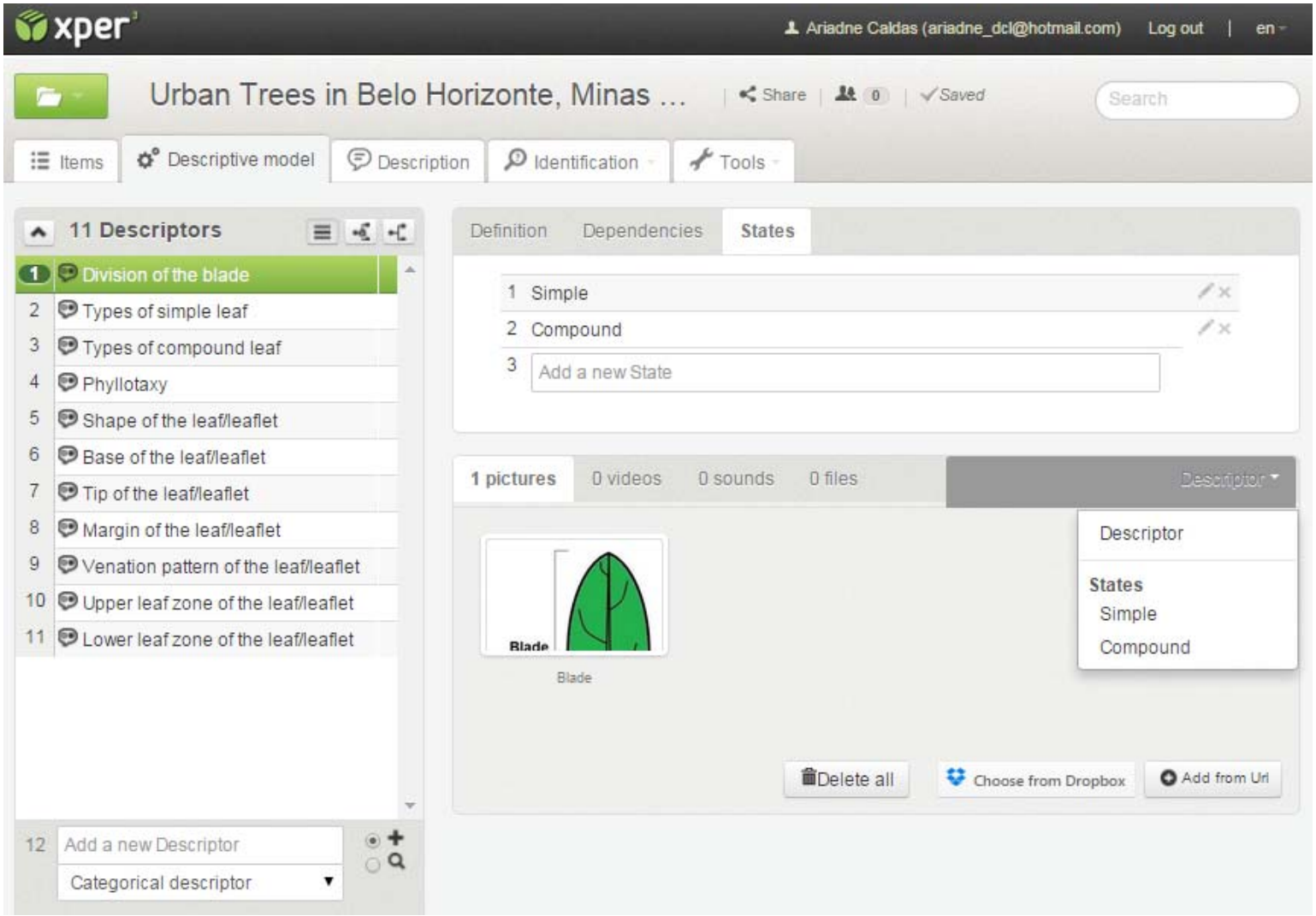

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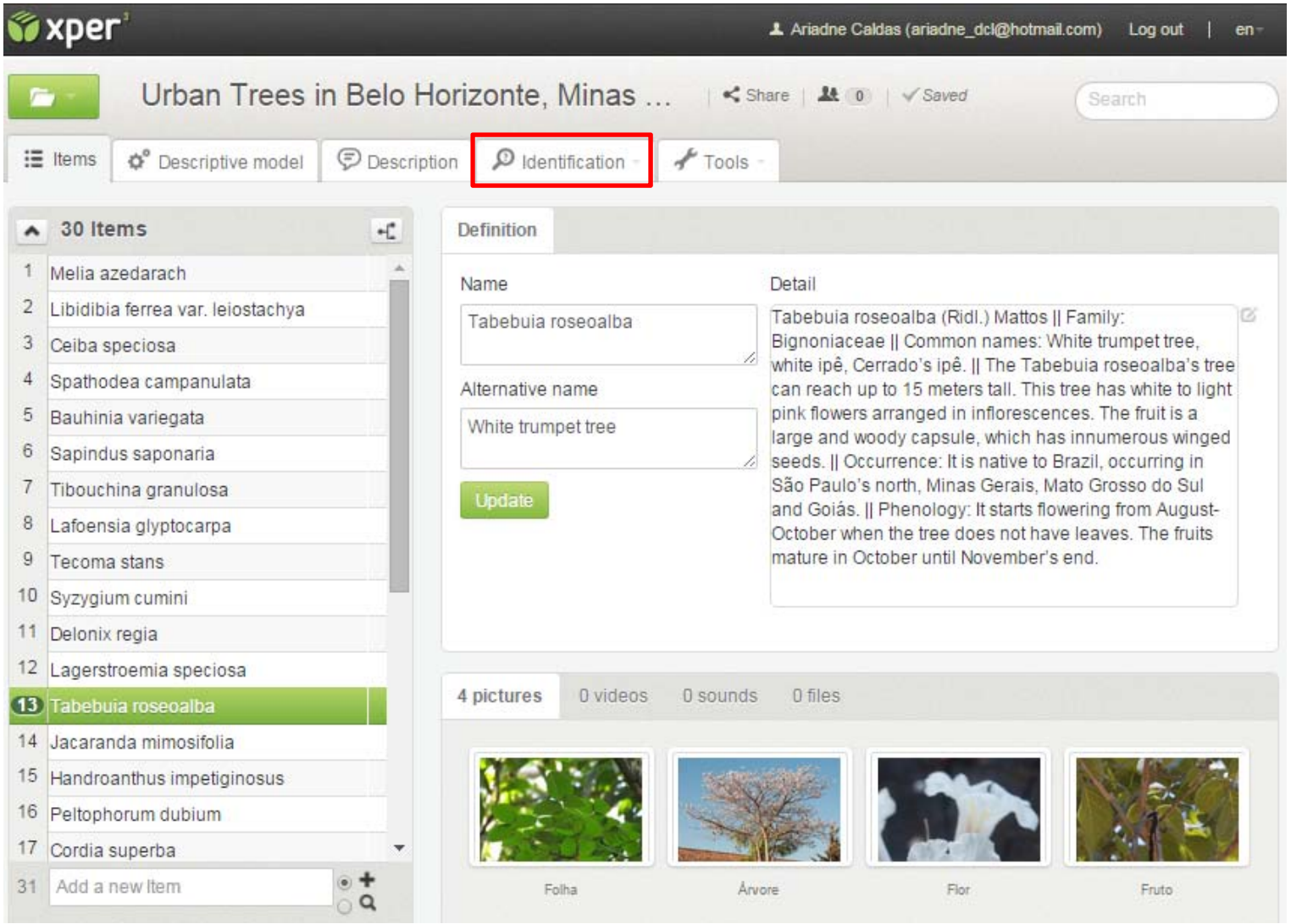

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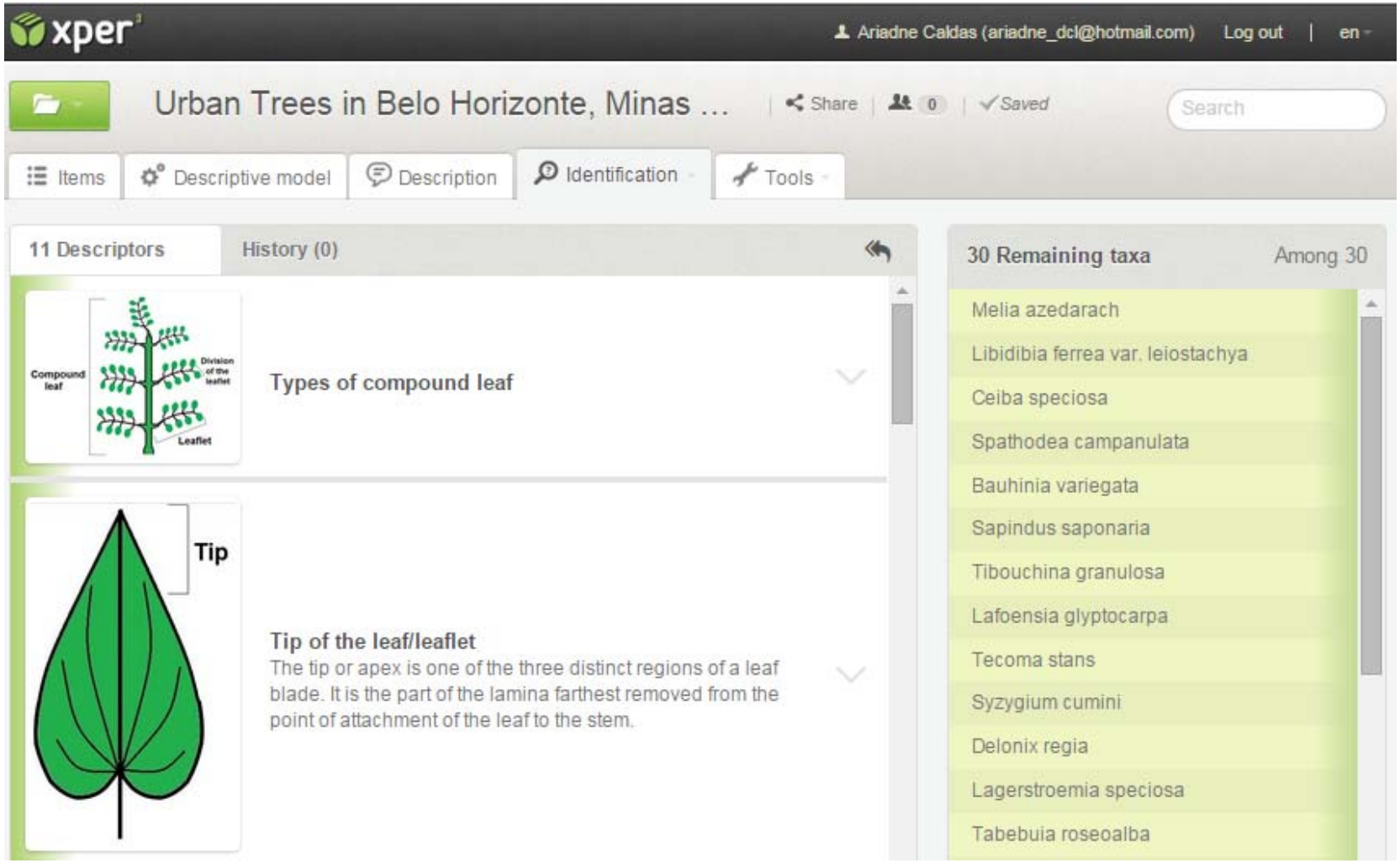

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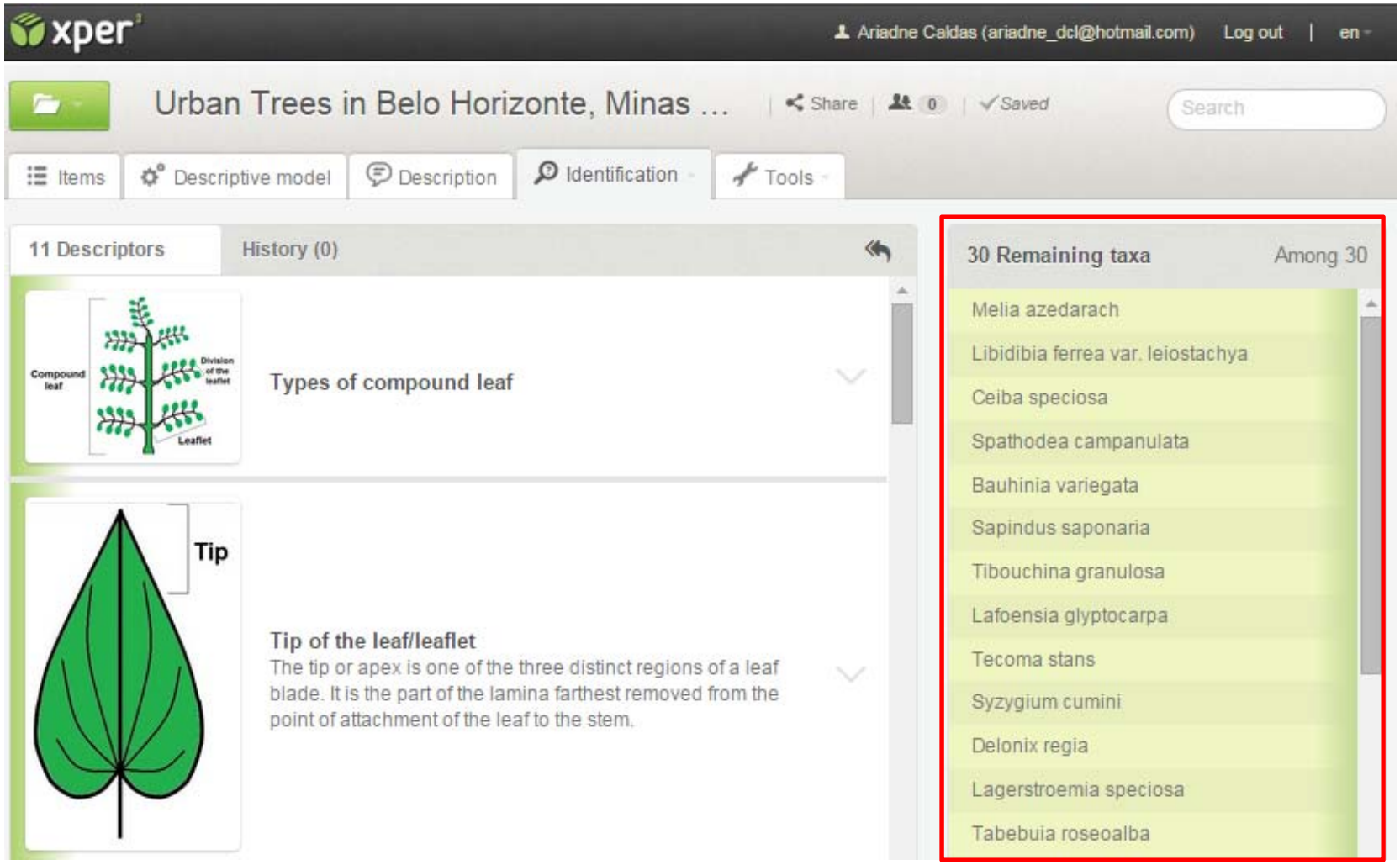

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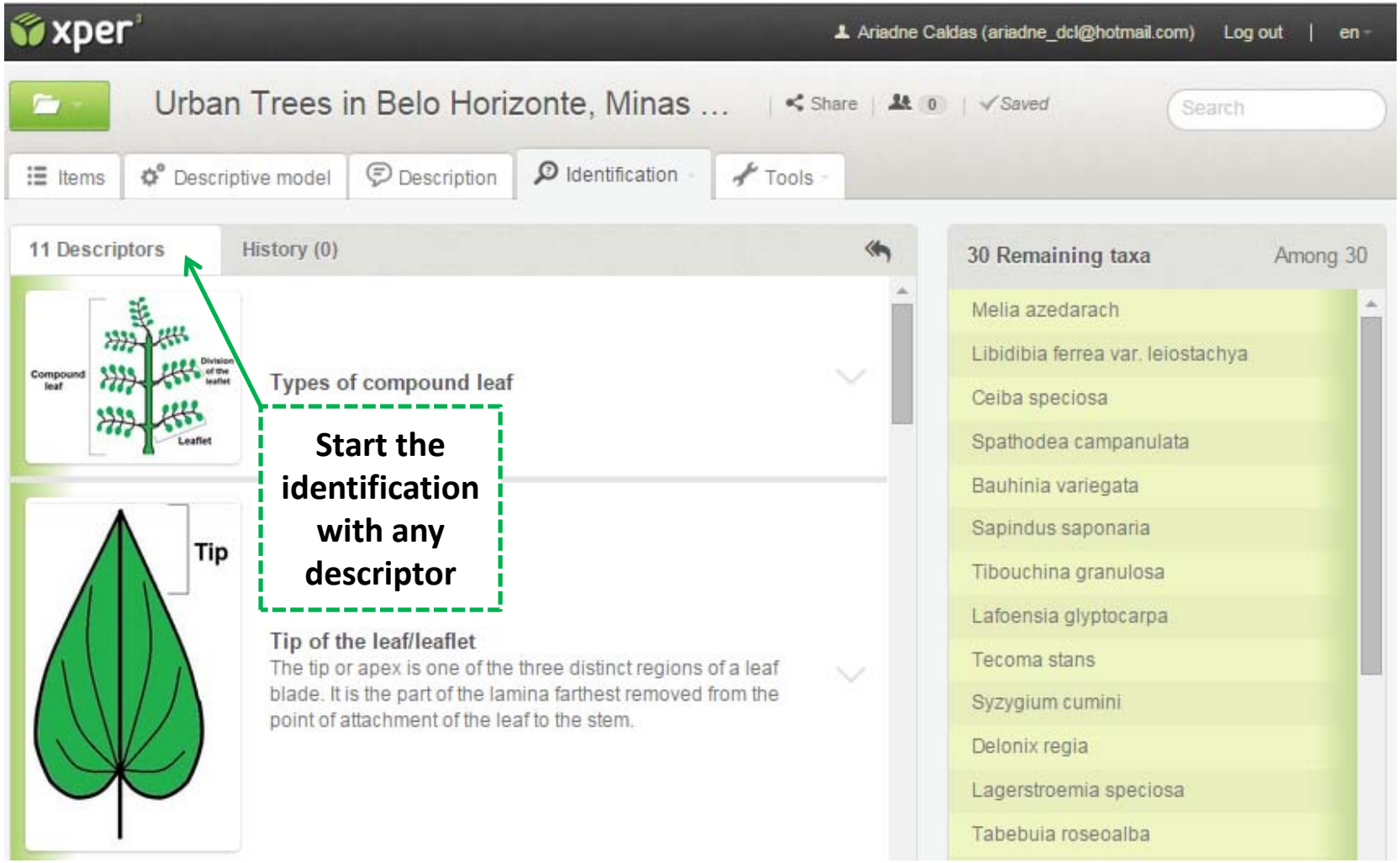

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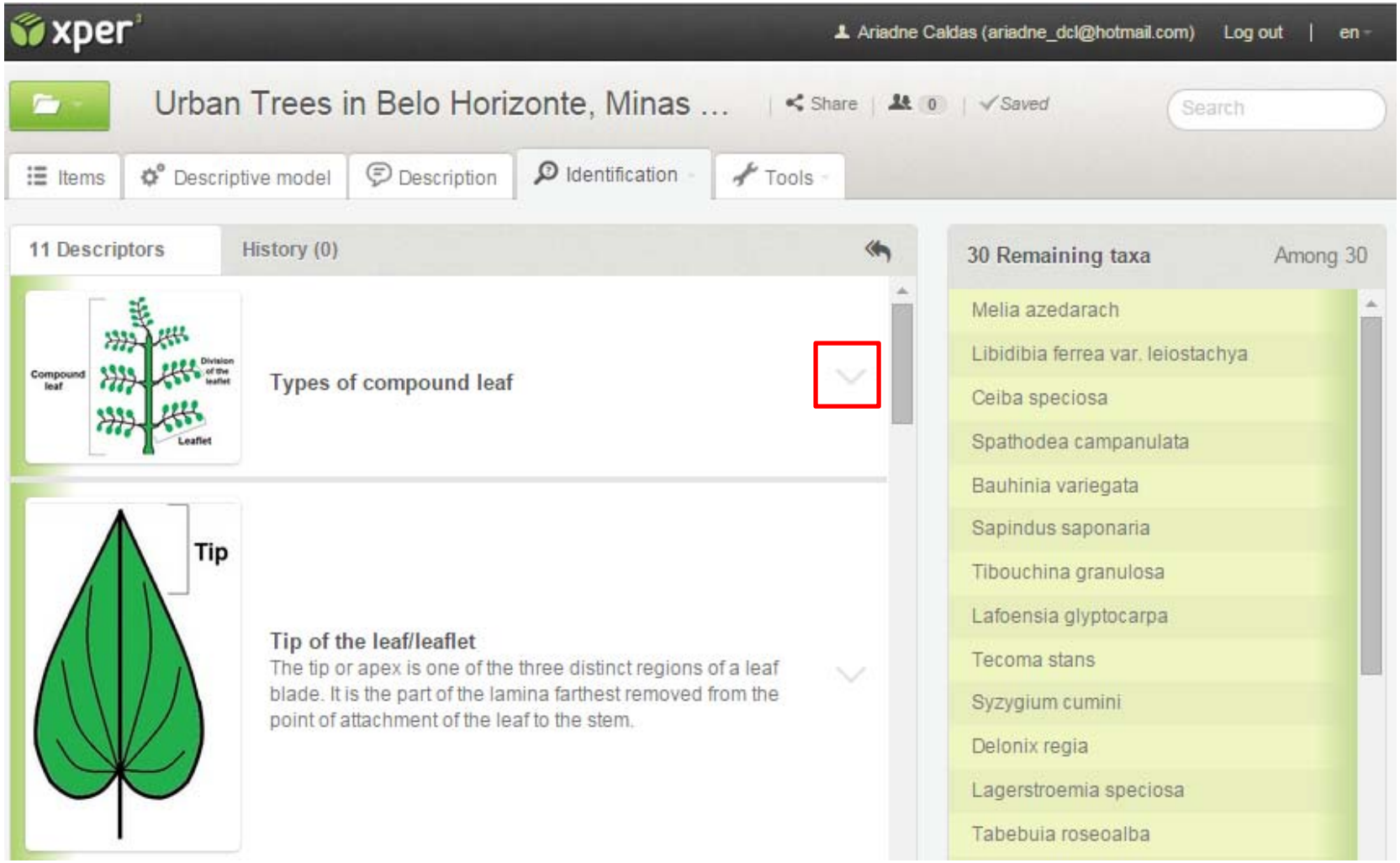

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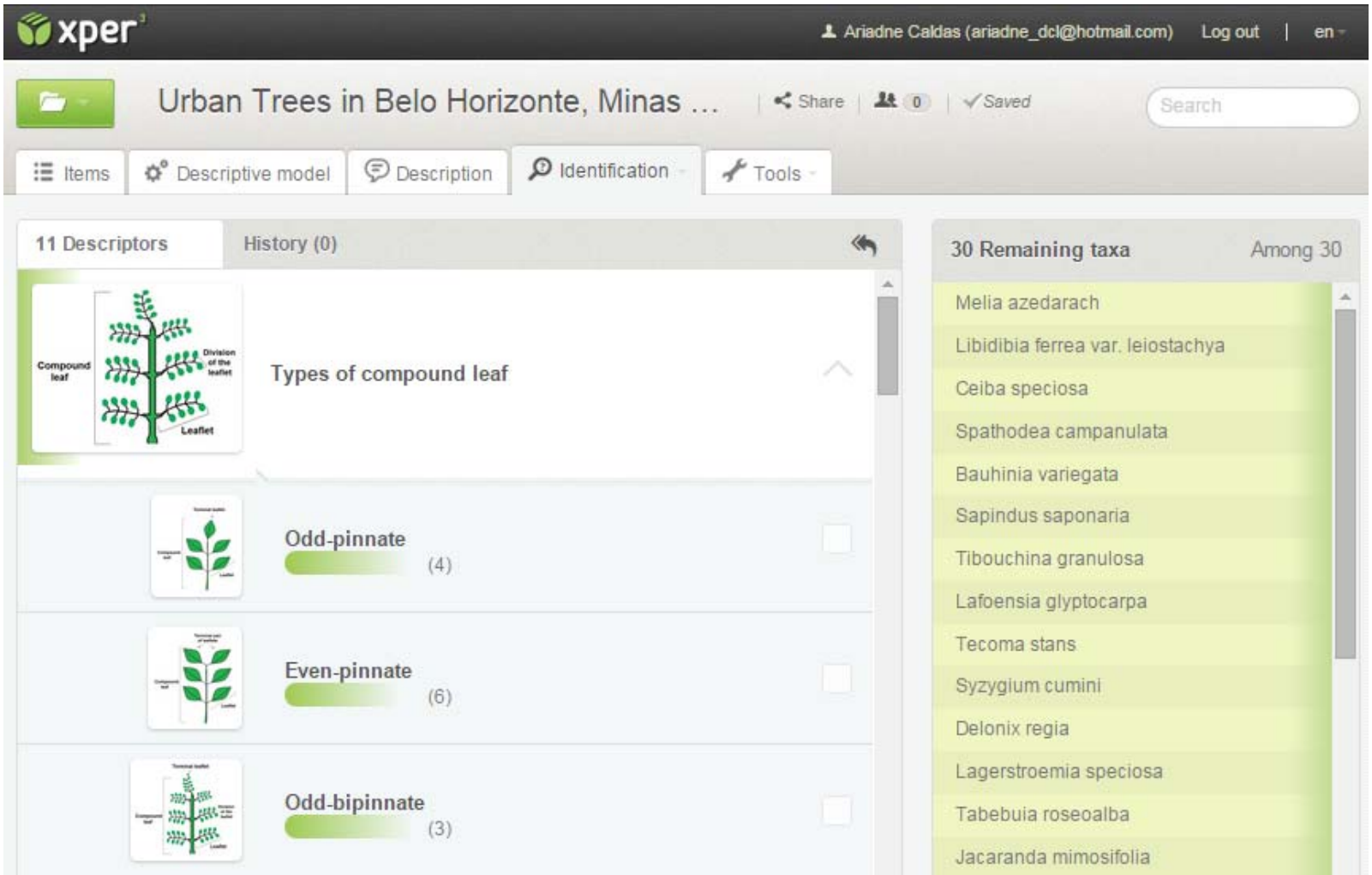

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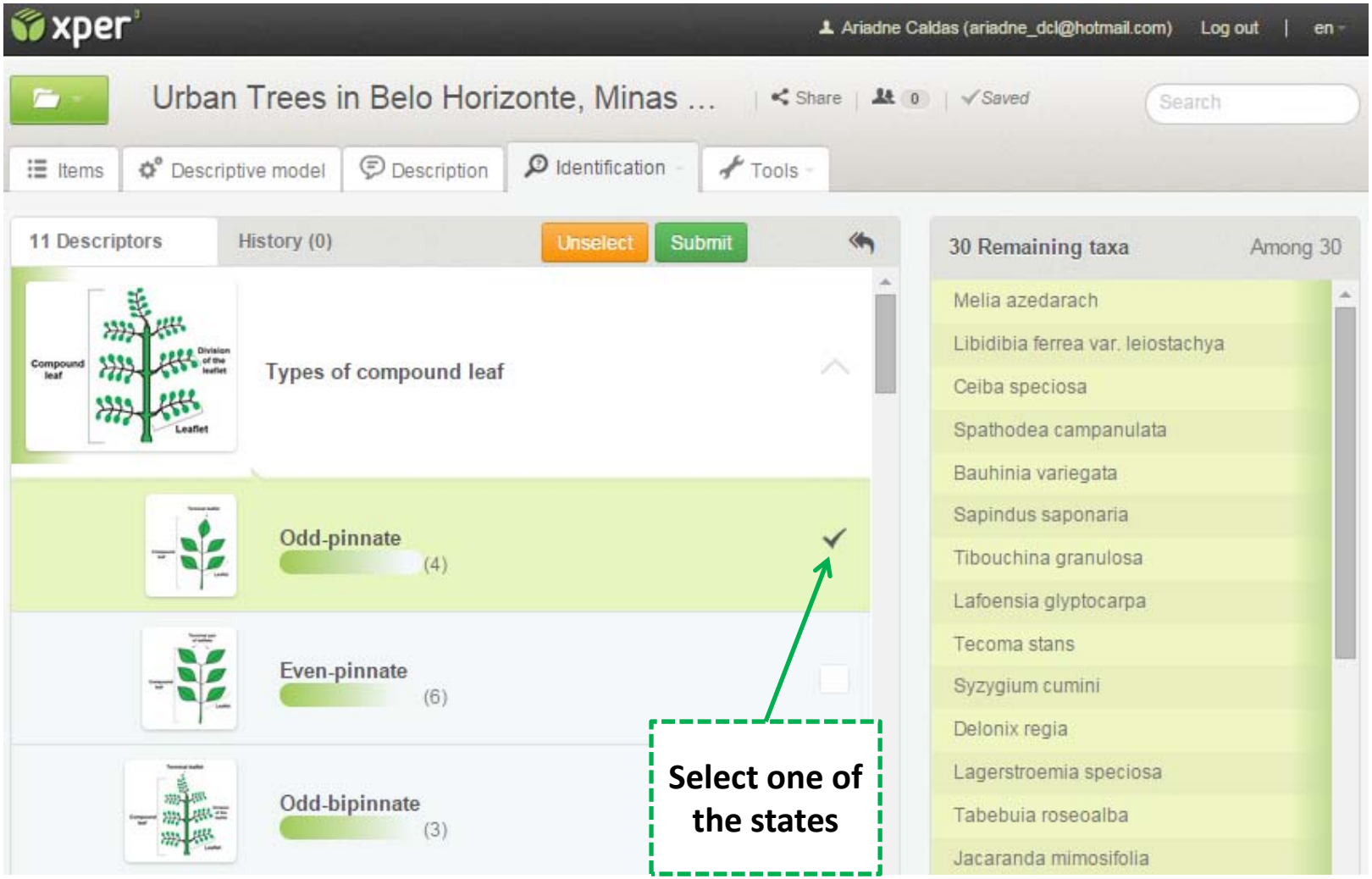

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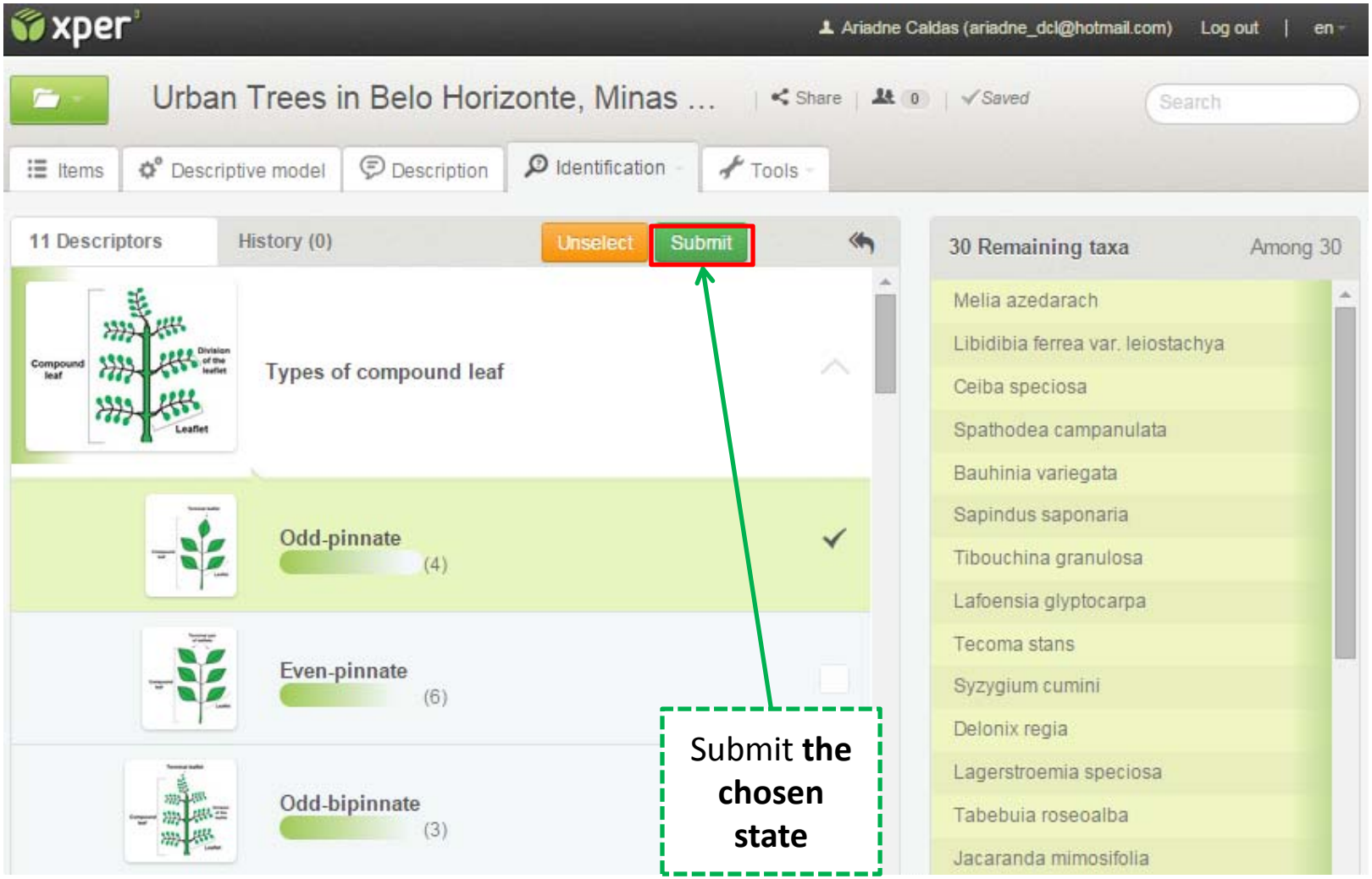

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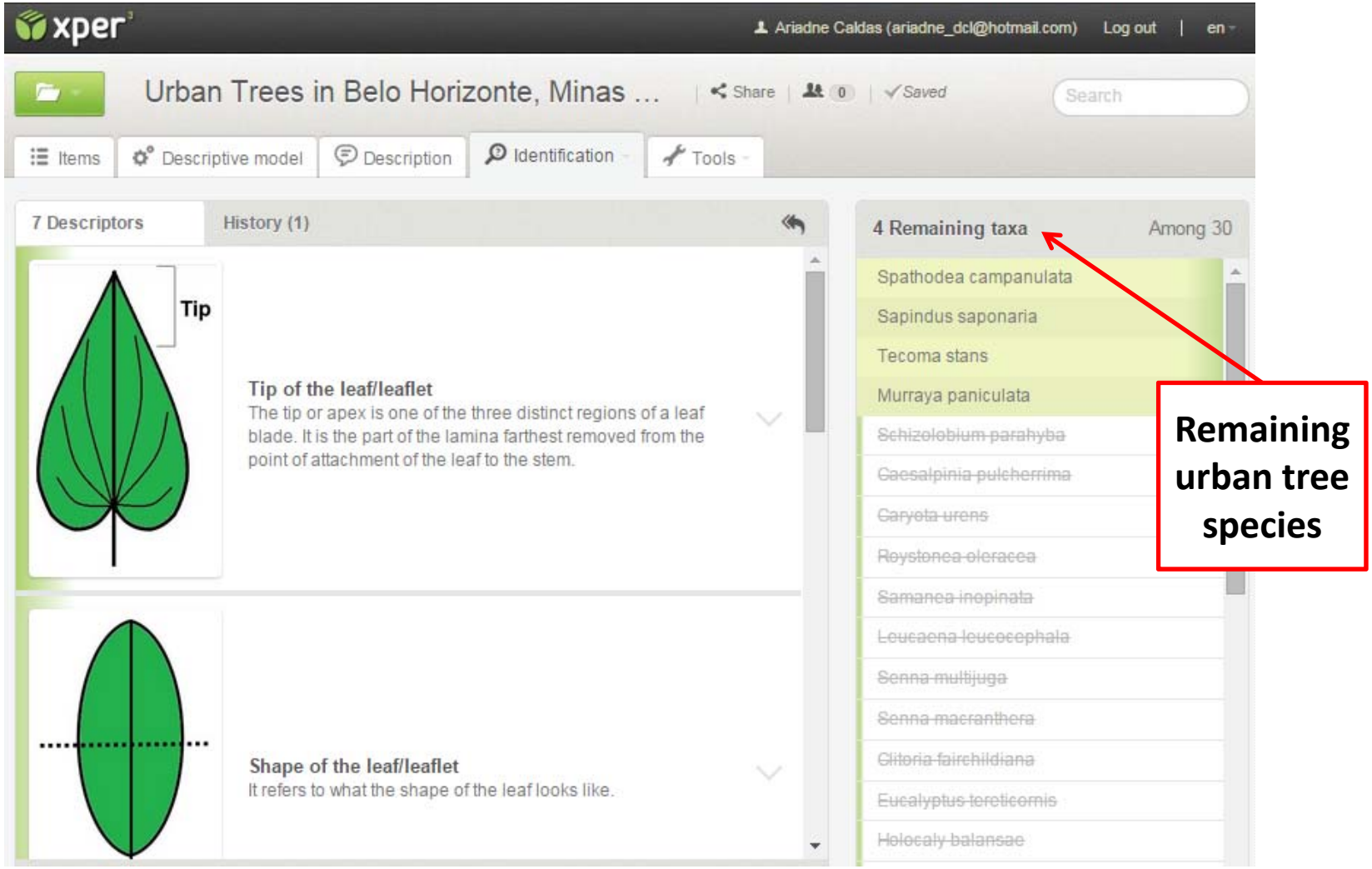

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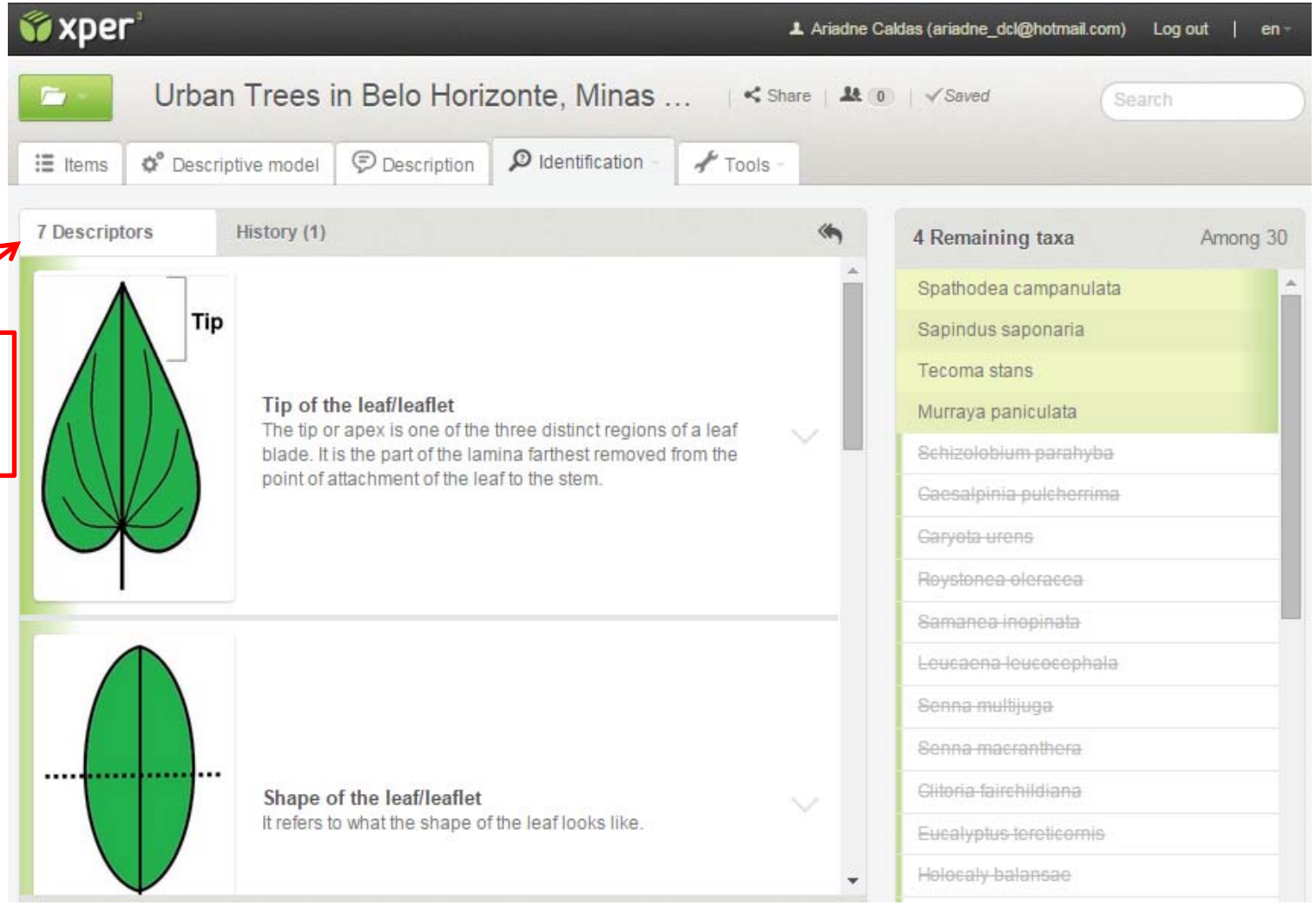

Remaining descriptors

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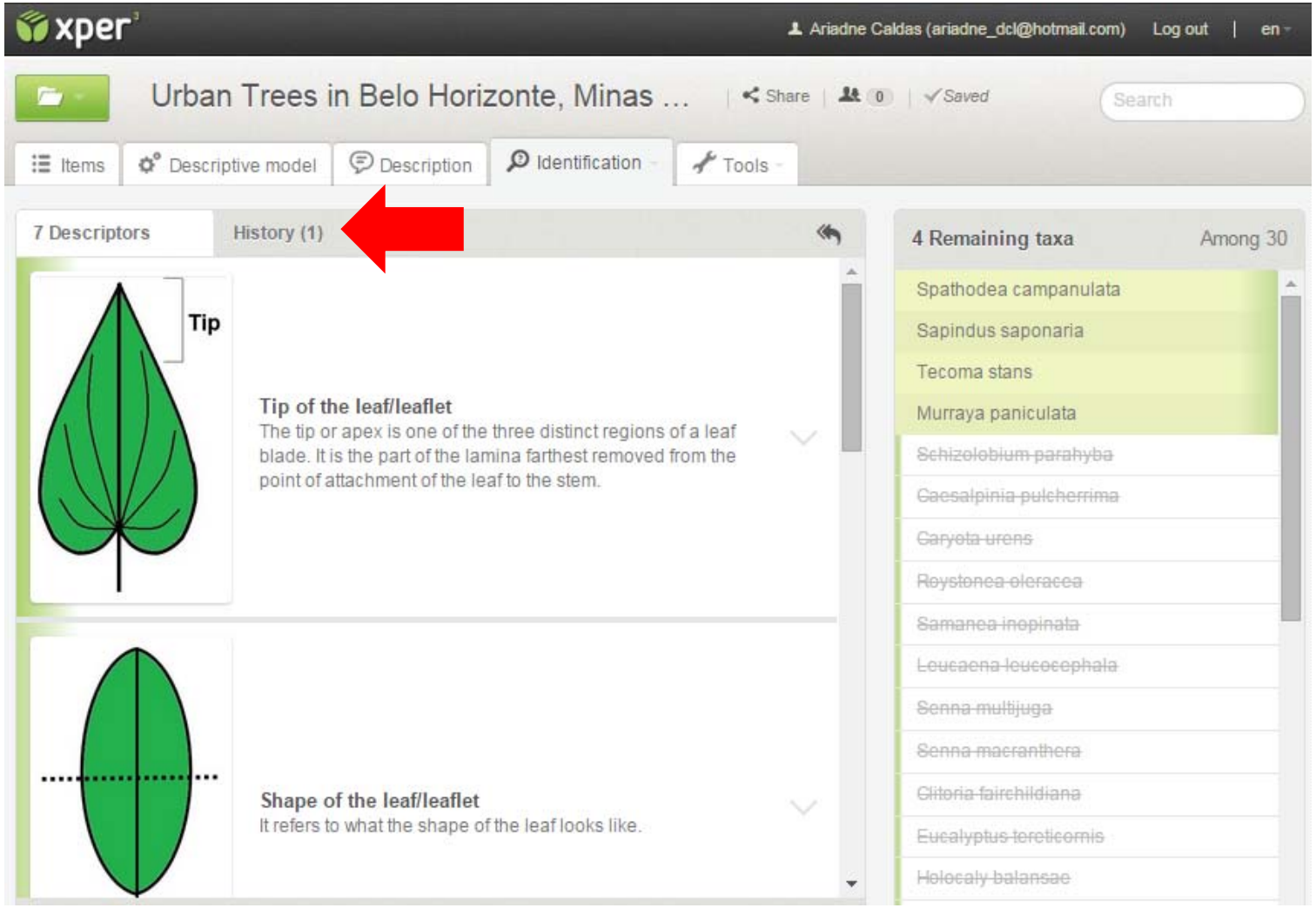

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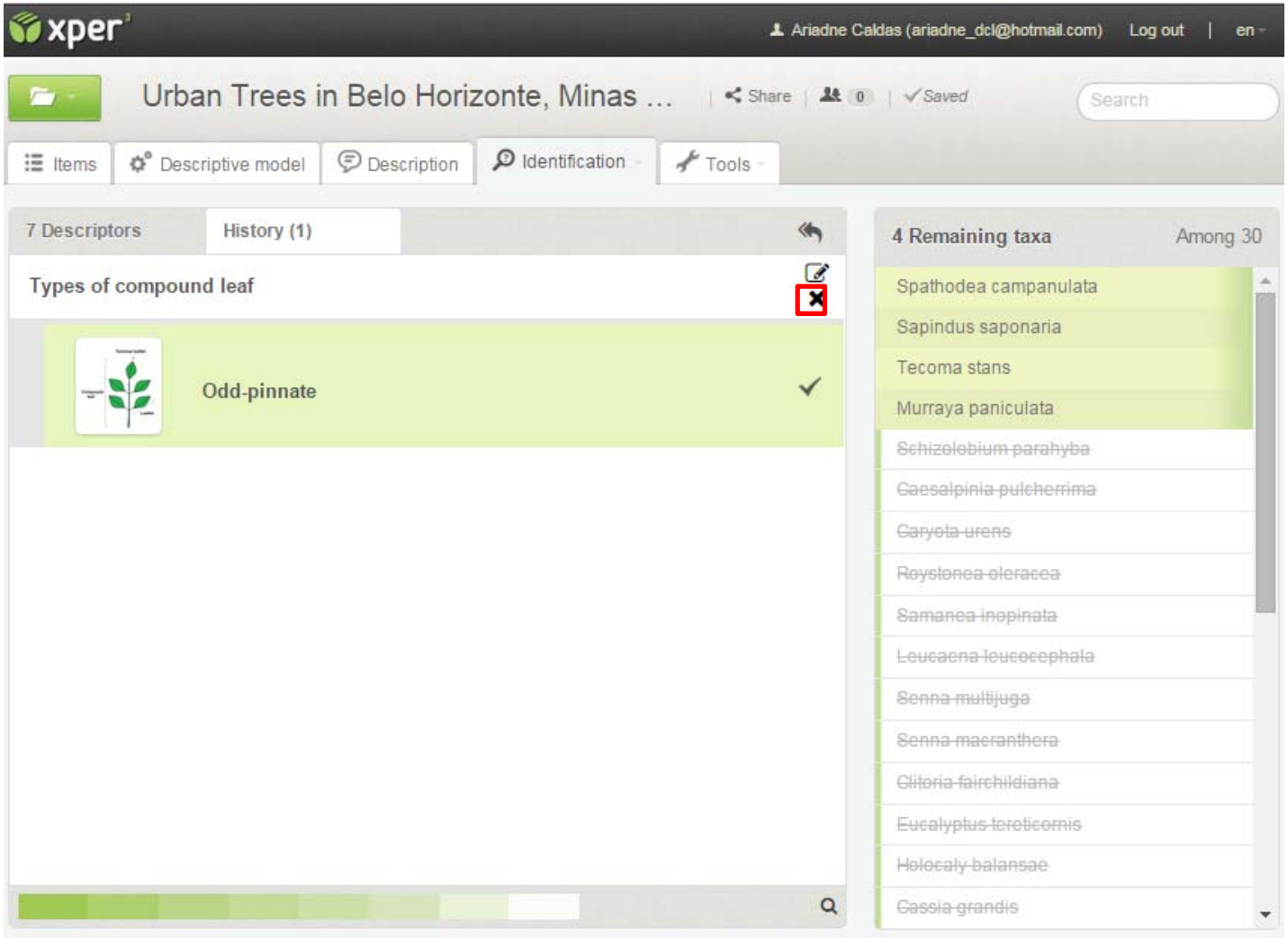

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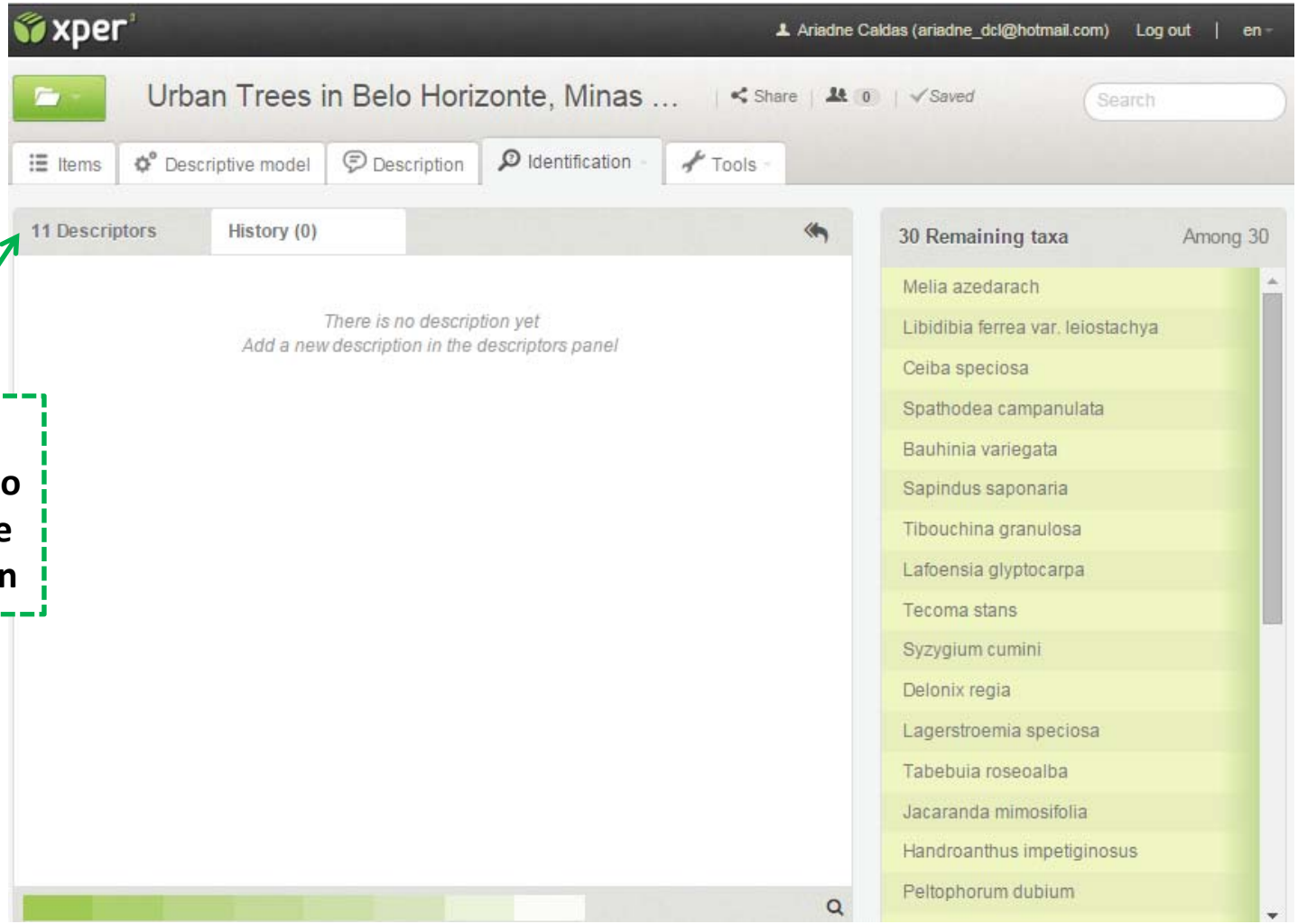

Click on Descriptors **to continue the identification**

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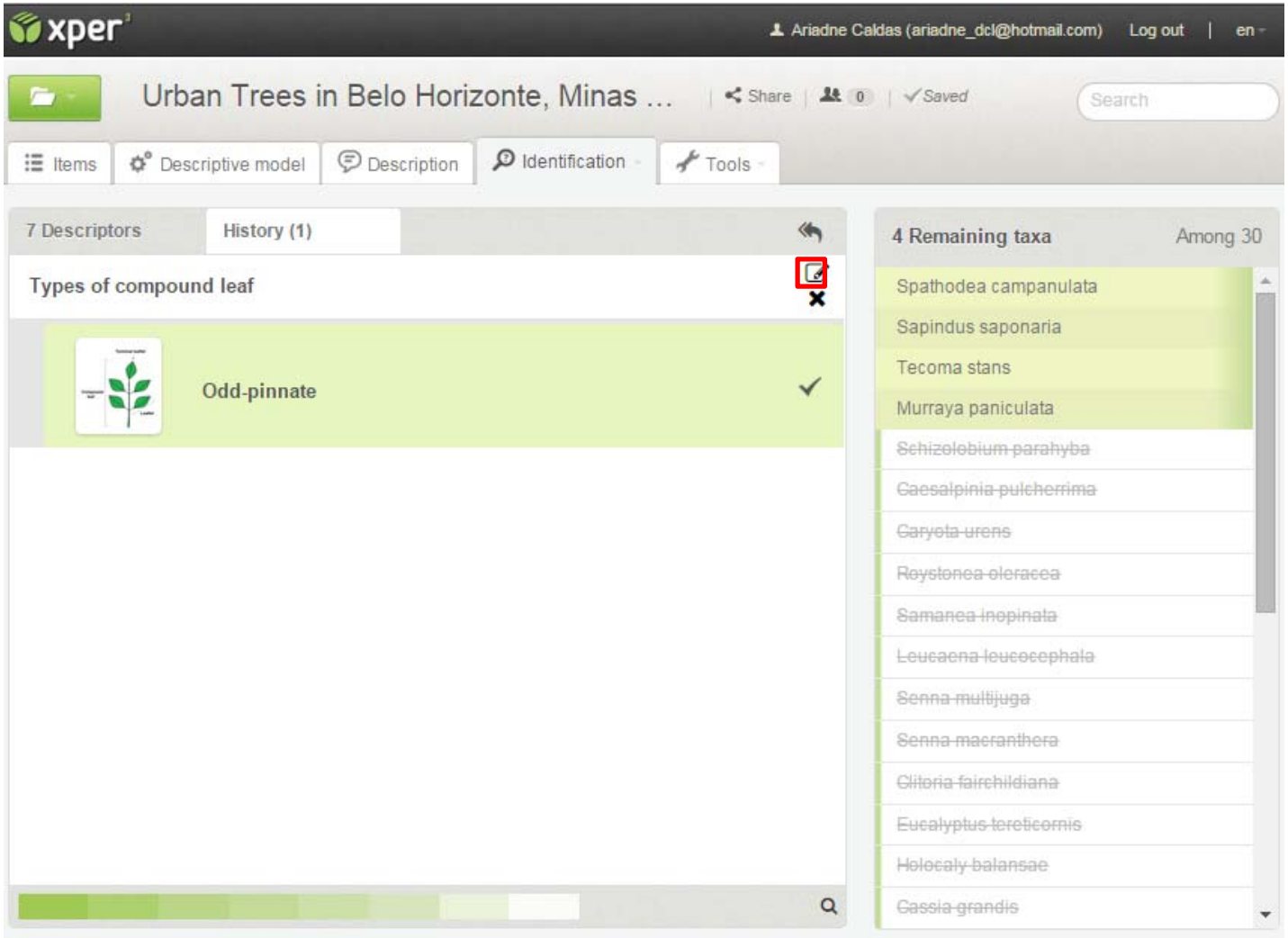

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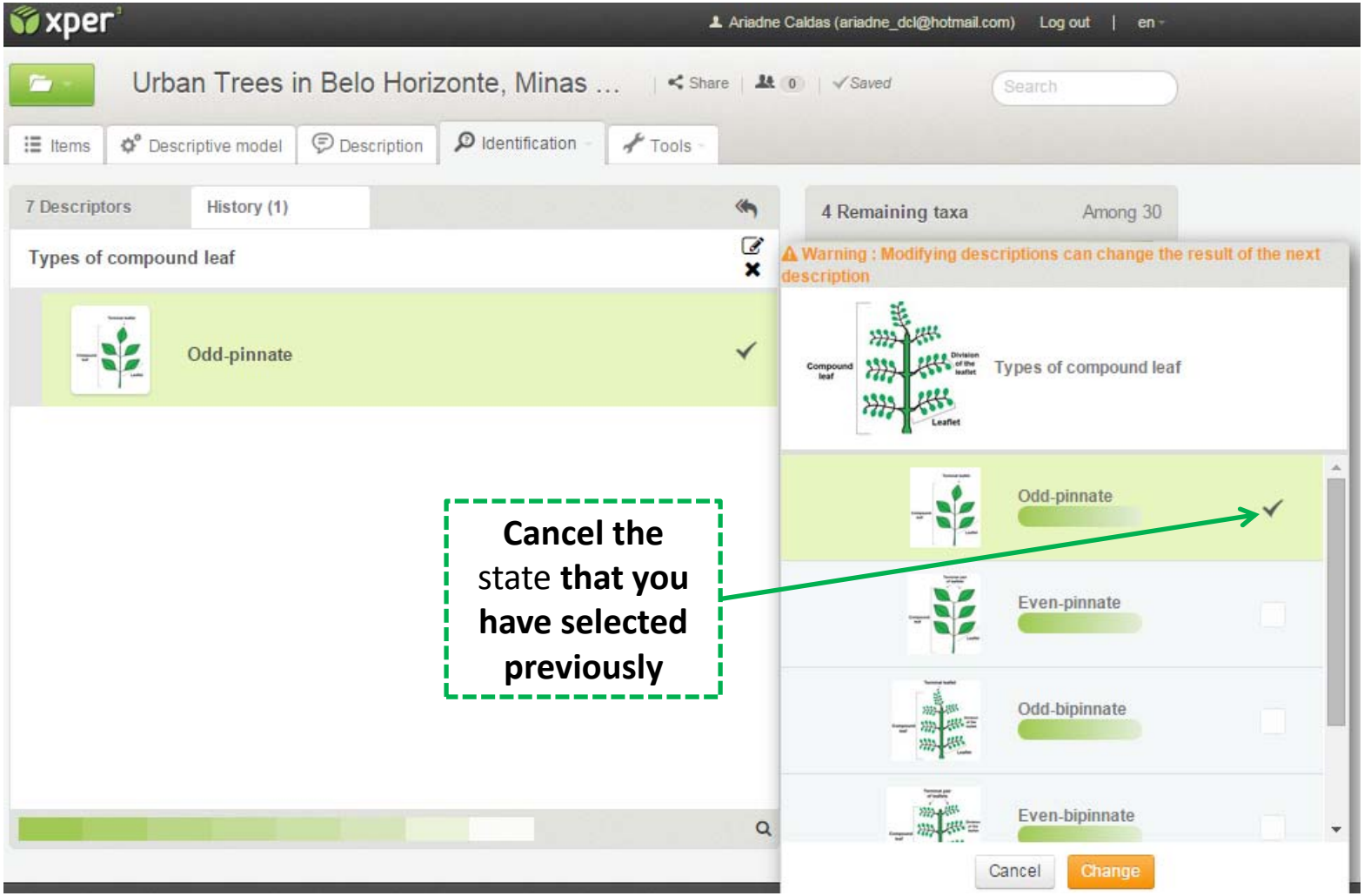

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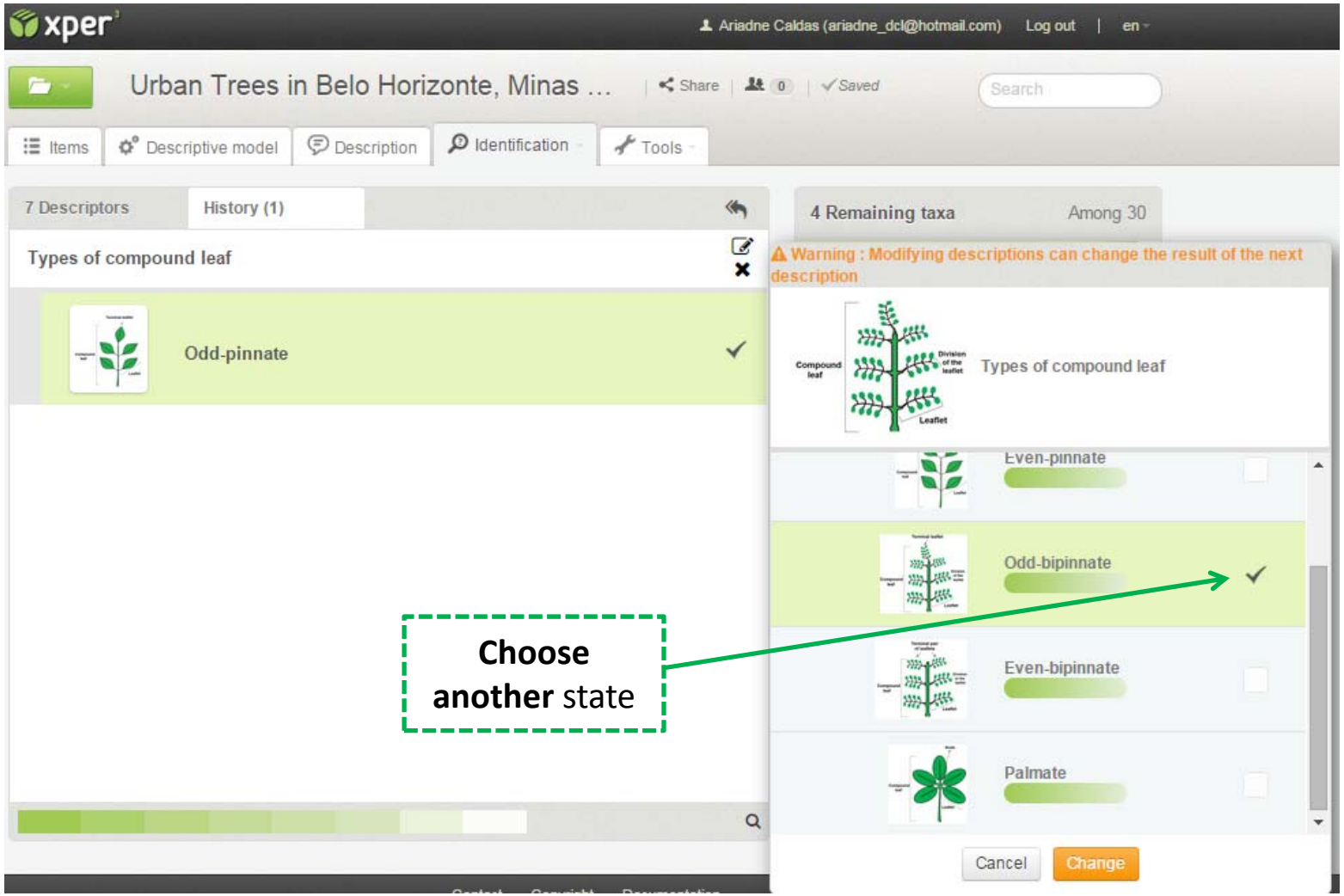

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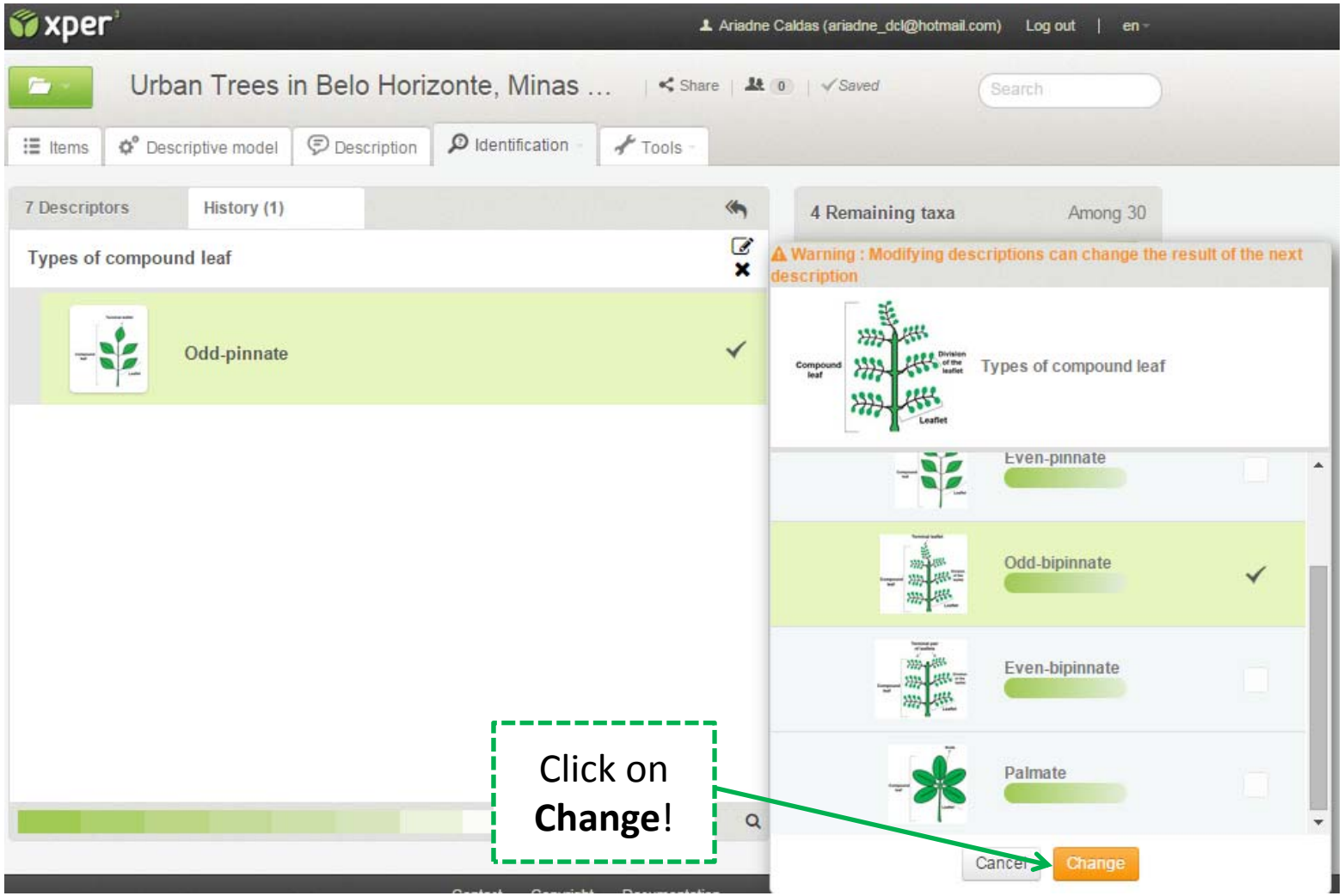

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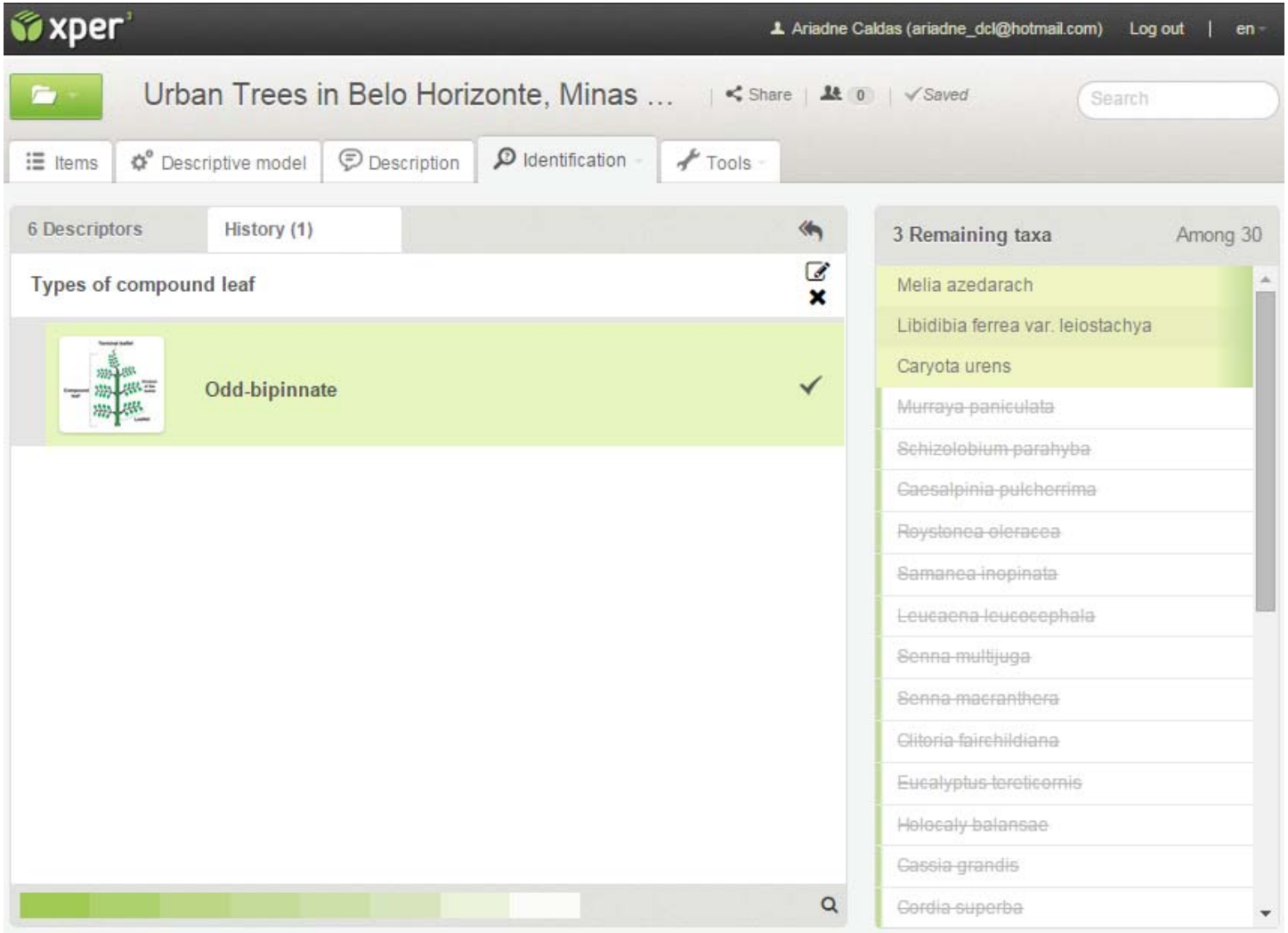

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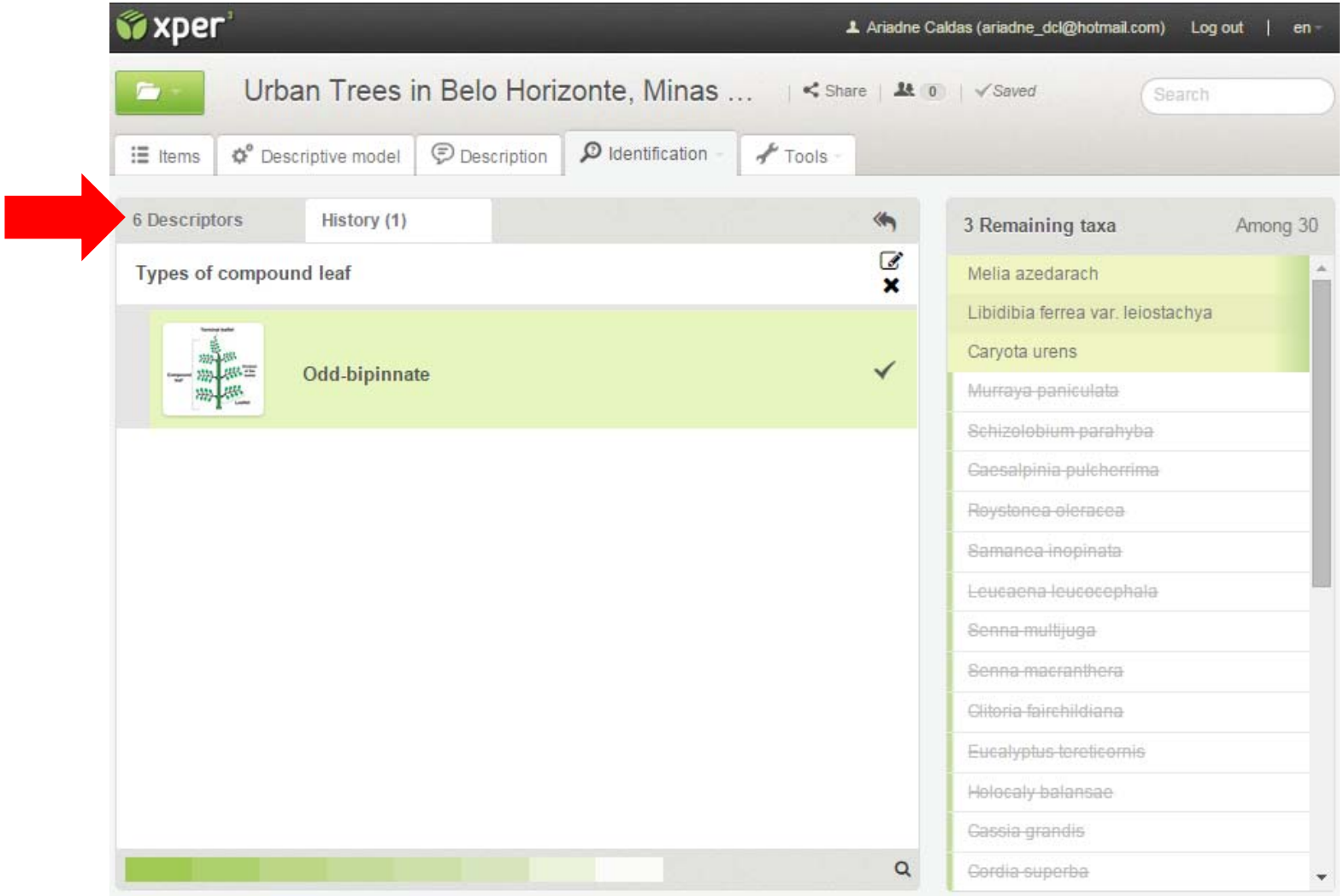

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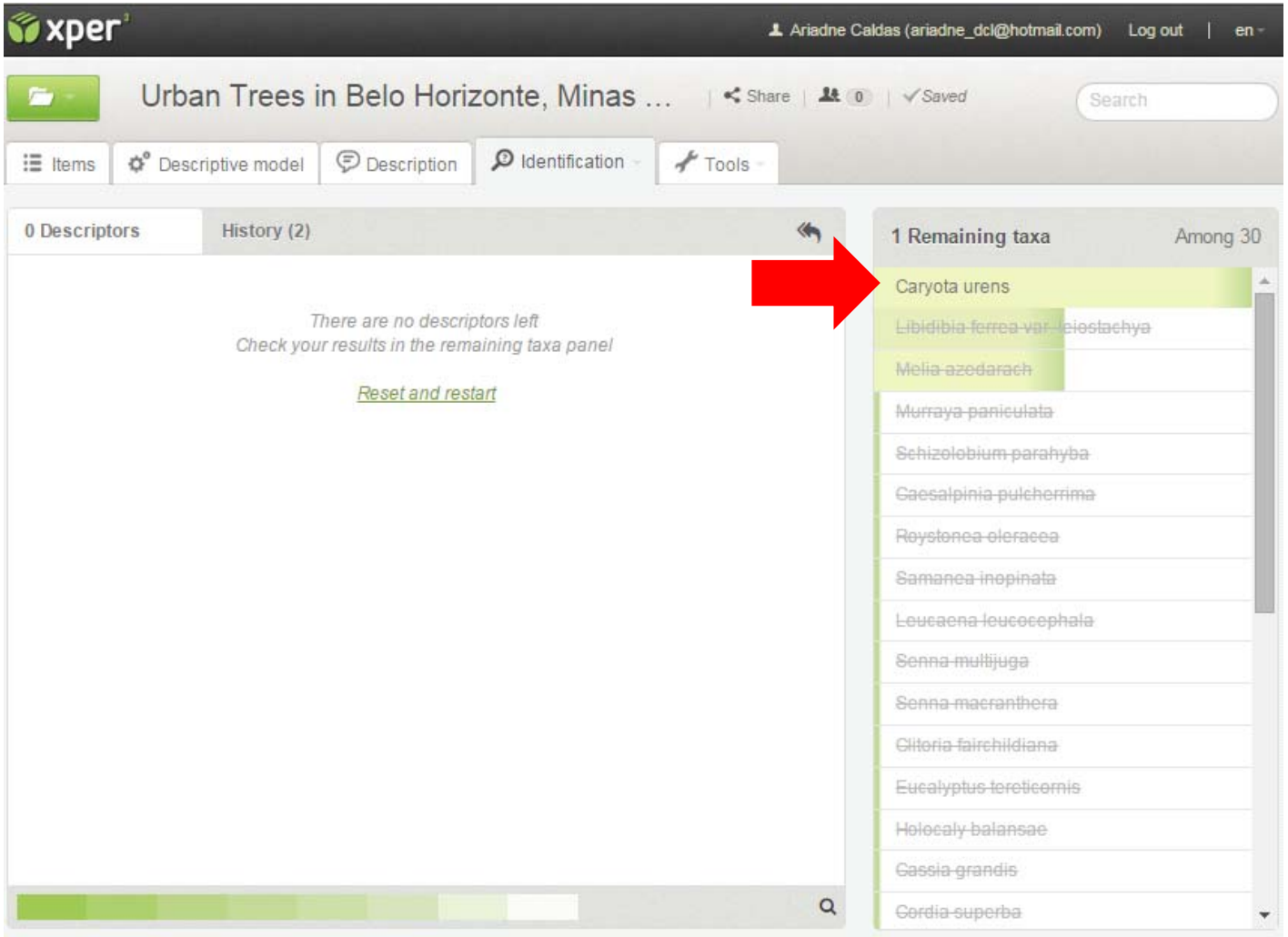

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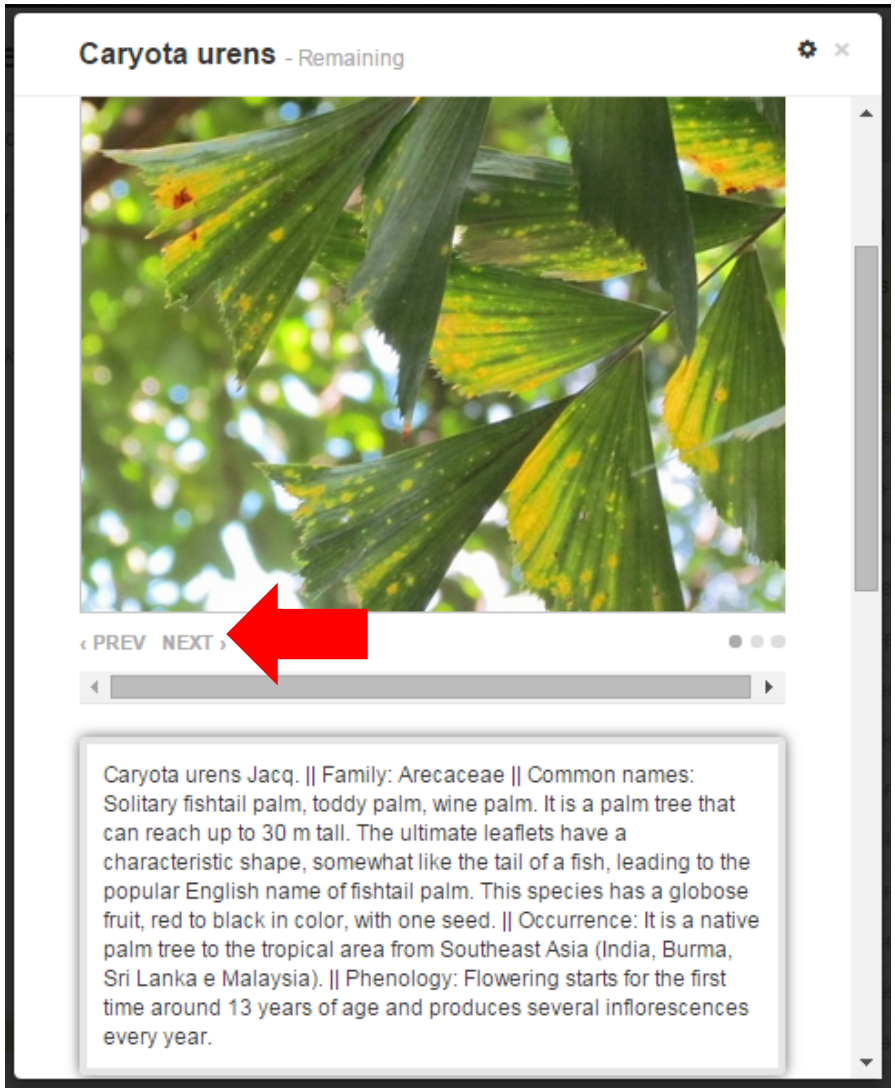

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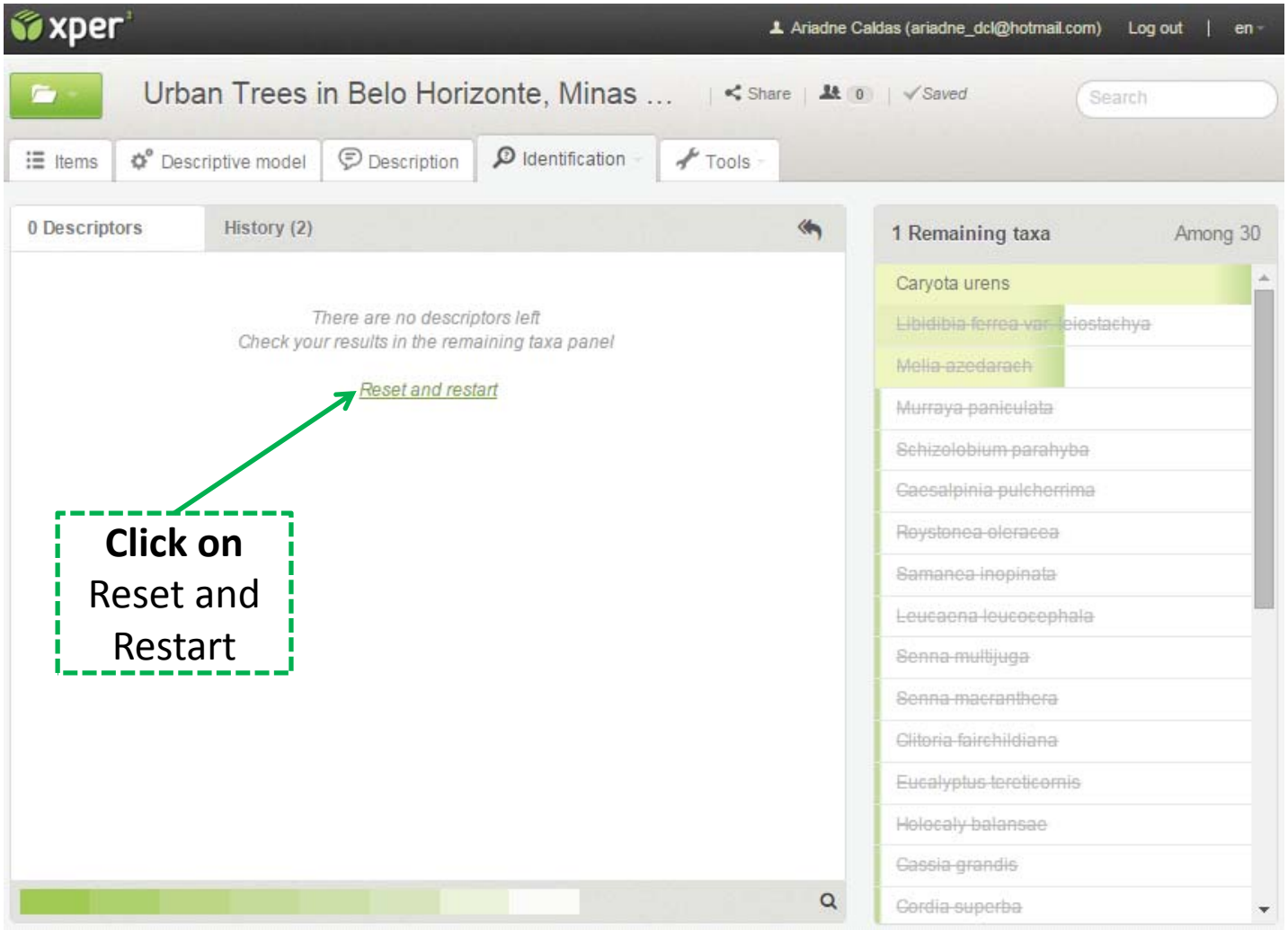
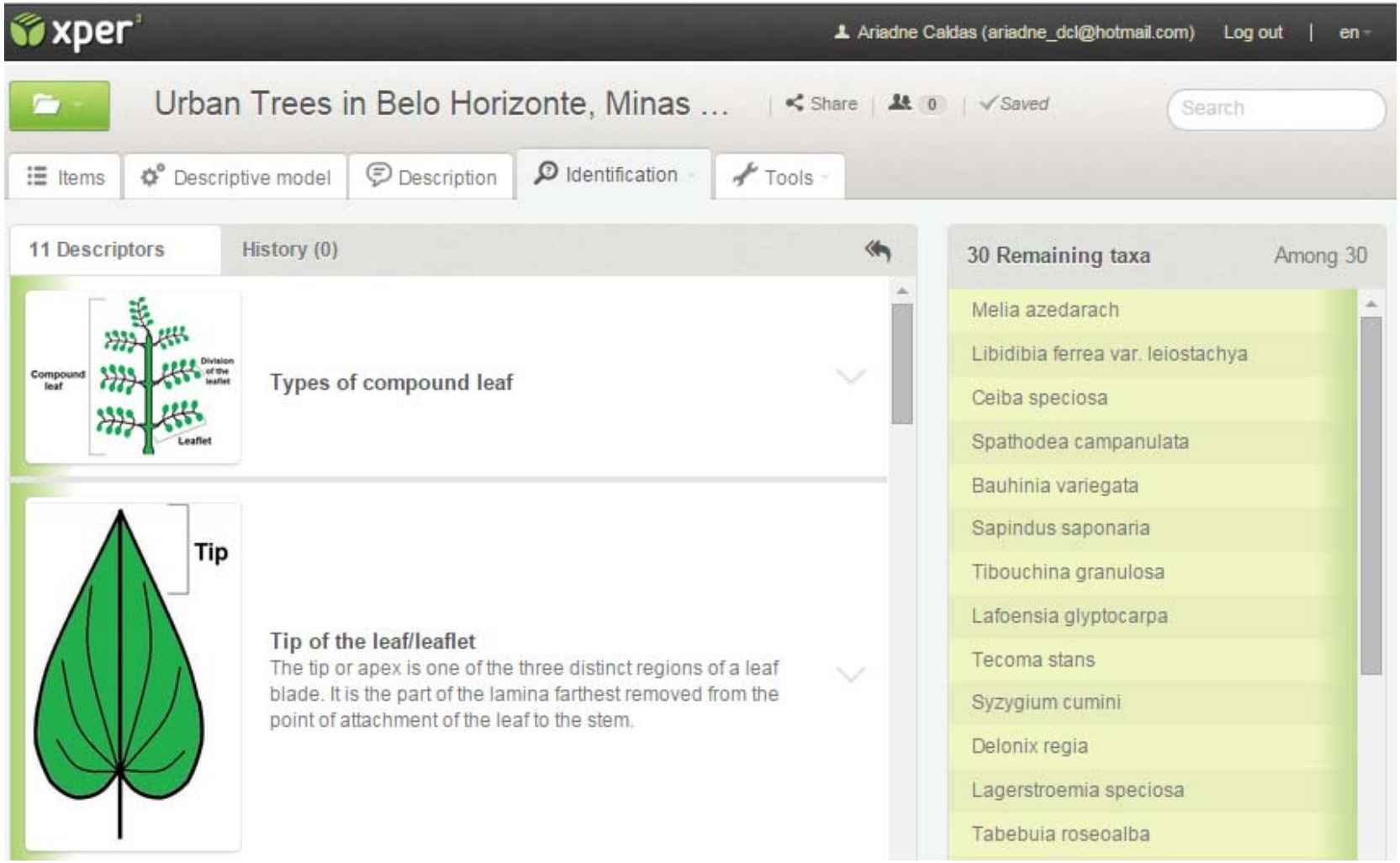


TUTORIAL XPER^3



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