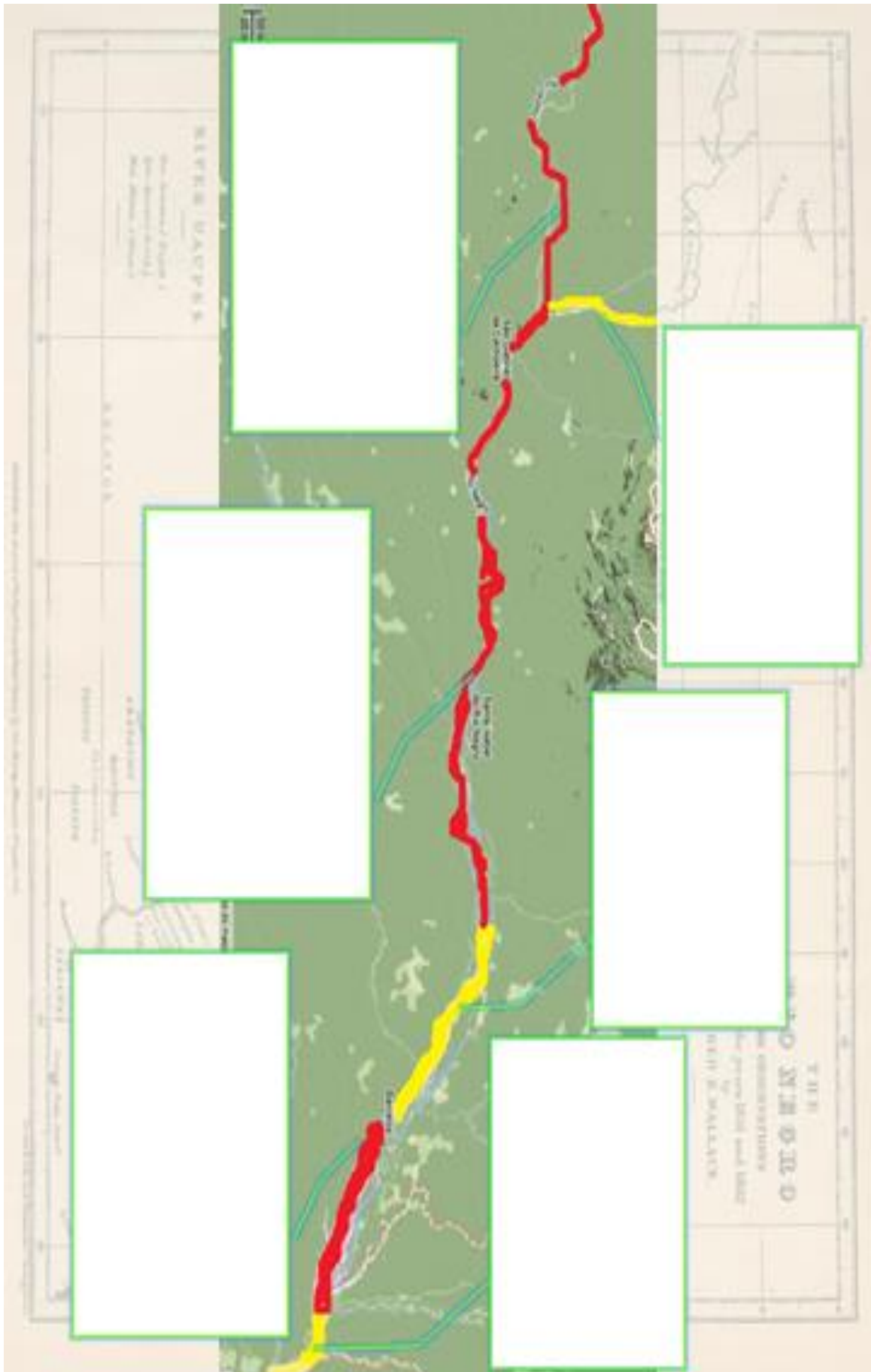


Class 1 - Naturalist Alfred Russel Wallace and his journey to Brazil

After watching the PowerPoint presentation on aspects of Wallace's life and work and his journey through the Amazonian rivers, fill in the information in the gaps on the map below:



10								
11								
12								
13								

Class 3 - Biological classification of palm trees observed by Wallace

We are now going to establish an organization of the palm trees designed by Wallace. Try to form groups with the palm species cards (Wallace's drawings and Lorenzi's photos), numbered from 1 to 13. As both sets of cards feature the same palm trees, you choose which of the groups you want to work with. The idea is to start by organizing the species into groups, which we will call genera (these should contain the palms that are more similar to each other than to any others present in other groups). Assign a number to each genus you can form.

1) How many genres did you manage to form?

A.: _____

2) What criteria did you use to form these groups?

A.: _____

Now try to form new groups based on the genres, reorganizing them into larger groups. These new groups represent what we will call palm subfamilies.

3) Comparing the formation of groups in the category of subfamilies with that of genera, how do you evaluate this attempt:



easier



same thing



harder

4) Finish the activity by completing the table 1 below with the groups you managed to form from the Amazon palm trees designed by Wallace. In the “species” line write the numbers referring to the palm trees that you organized. This organization constitutes the genres (use the symbols G1, G2, G3, etc.) which must be written on the line corresponding to the “genres”. Finally, complete the line of “subfamilies” with the larger groups that you managed to form with genera (use the symbols SB1, SB2, etc).

Class 4 - Elaboration of a dichotomous key of palm trees

Identification and classification are intended to enable human beings to better understand the world in which they live. This curiosity to know the names of organisms dates back to Antiquity, and over the centuries we have learned to recognize useful plants for building houses, for serving as food, for making medicine or poison, for example.

The dichotomous key

Dichotomous keys can be used in the study and processes of identification, recognition and classification of biological species.

A dichotomous key is elaborated from the definition of distinct characteristics (generally mutually exclusive) that serve to differentiate groups of organisms or species in characteristics that converge or diverge for a specific type in contrast.

The dichotomous keys are formed by a series of sentences with information about the characteristics of a group of living beings. In the case of plants, for example, dichotomous keys can help to differentiate species that belong to the same group, thus enabling the recognition of several plants of a single family (Annunciato et al, 2010, p. 158). Exactly what we want to do with some of the palm trees observed by Wallace on his trip to the Amazon region.

Guidelines:

Start the activity by separating the images of palm trees into subgroups, as shown in the key. Choose, first, which characteristic you want to start the identification with. For example, you can select all palm trees that have thorny stems and group them; separating in another group the images of the plants that do not present the cited characteristic.

Then, they decide which of the groups they intend to continue the identification with. If you choose the group of palm trees whose stems have thorns, you must reserve the images of palm trees without thorns on the stems. These plants will be identified later.

It is with this exercise that you will identify the scientific (and popular) names of palm trees that until now had numbers in their identification. Use the information from the Dichotomous Key below:

Dichotomous Key – Wallace's Palms¹

1.
 - a) Stem with thorns goes to number 2
 - b) Stem without thorns goes to number 4
2.
 - a) Fruit with sheath *Bactris gasipaes* (Pupunha)
 - b) Fruit without sheath goes to number 3
3.
 - a) Pinnate leaves (feather-shaped) with separate leaflets..... is *hirta* (Marajazinho from the igapó)
 - b) Pinnate (feather-shaped) leaves with united leaflets..... *Bactris simplicifrons* (Marajazinho)
4.
 - a) Stem with fibers goes to number 5
 - b) Stem without fibers goes to number 7
5.
 - a) Long fibers *Leopoldinia piassaba* (Piaçava)
 - b) Short fibers goes to number 6
6.
 - a) Simple stem *Leopoldinia pulchra* (Jará)
 - b) Multiple stems *Leopoldinia major* (Jara-açú)
7.
 - a) Fruits with sheath goes to number 8
 - b) Fruits without sheath goes to number 10
8.
 - a) Fruit with water *Cocos nucifera* (Coconut tree)
 - b) Fruit without water goes to number 9
9.
 - a) Fruits with 2 to 3 seeds..... *Attalea maripa* (Inajá)
 - b) Fruits with 4 to 8 seeds..... *Attalea speciosa* (Babassu)
10.
 - a) Fruits with scales goes to 12
 - b) Fruits without scales goes to number 11
11.
 - a) Simple stem *Euterpe catinga* (Açaí from catinga)
 - b) Multiple stems *Euterpe oleracea* (Açaí)
12.
 - a) Glossy reddish scales *Mauritia flexuosa* (Buriti)
 - b) Matte dark brown scales..... *Mauritia carana* (Carana)

¹ Dichotomous Key constructed from information contained in Lorenzi, Harri et al., *Flora Brasileira – Arecaceae (Palmeiras)*, 2010. Adapted for the 13 species studied by Wallace.

Class 5 - A phylogenetic tree based on living palm species

Based on the biological classification you made in Class 3 and the information on the dichotomous key of palm trees from Class 4, complete the phylogenetic matrix (matrix of morphological characteristics of Amazonian palm trees) right below, using the symbols (1) for presence and (0) for absence of the feature.

CHARACTERISTICS	<i>E. oleraceae</i> (1)	<i>M. carana</i> (2)	<i>C. nucifera</i> (3)	<i>L. major</i> (4)	<i>A. maripa</i> (5)	<i>B. simplicifrons</i> (6)	<i>E. caatinga</i> (7)
stem with thorns							
fibers at the apex of the stem							
fruit covered with scales							
palmete costa leaf (fan-shaped)							
pinnate leaf							
fruit with water							
black fruit							
sheathed fruit							
thorny structure protecting the fruit							
fruit smaller than 20 cm and not covered with scales							
inflorescence protected by bracts							
CHARACTERISTICS	<i>B. gasipaes</i> (8)	<i>L. piaçaba</i> (9)	<i>M. flexuosa</i> (10)	<i>A. speciosa</i> (11)	<i>B. hirta</i> (12)	<i>L. pulchra</i> (13)	
stem with thorns							
fibers at the apex of the stem							
fruit covered with scales							
palmete costa leaf (fan-shaped)							
pinnate leaf							
fruit with water							
black fruit							
sheathed fruit							
thorny structure protecting the fruit							
fruit smaller than 20 cm and not covered with scales							
inflorescence protected by bracts							

Class 6 - Construction of the phylogenetic tree

In this class, you will create a phylogenetic tree with the information from the phylogenetic matrix that you did in class 6. Use the space below to do so: