



OPERAČNÍ PROGRAM PRAHA
ADAPTABILITA

EVROPSKÝ SOCIÁLNÍ FOND



PRAHA & EU
INVESTUJEME DO VAŠÍ BUDOUCNOSTI

Pracovní list č. 7

Trojské trumfy

pražským
školám

projekt
CZ.2.17/3.1.00/32718



TROPICAL RAIN FOREST
IN THE BOTANICAL GARDEN





complete



homework



write



help



laboratory work



presentation

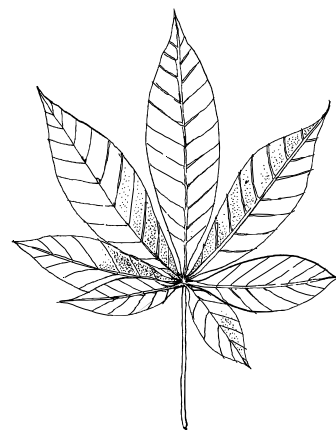


optional task



take a photo

DP = didactic pack



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Tropical

Worksheet for the botany project

BOTANY, ECOLOGY
Intended for group work

RAIN FOREST IN THE BOTANICAL GARDEN

The tropical rainforests (TRF) are written and spoken about very often, especially because it is disappearing fast. That is why everybody has an idea of what tropical forests look like but only a few people here have seen it with their own eyes. In the greenhouse Fata Morgana you can see and observe some of the major species of TRF from different corners of the world. They are arranged to reflect their diversity and variety as well as their relationships. This worksheet will enable you to learn about the distinctive features of vegetation in the lowland tropical rainforests

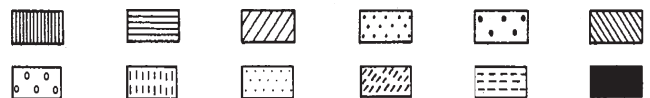
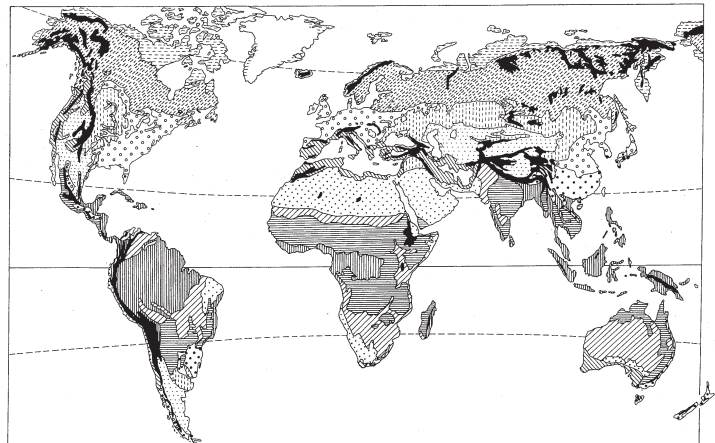
1. In the legend: circle the symbol used in the map for tropical rain forests.



2. Using your knowledge and the map complete the following text:

Most of the TRF's are situated near the equator, between _____ of northern latitudes and _____ of the southern latitudes. The main areas of its occurrence are:

1. _____
2. _____
3. _____
4. _____

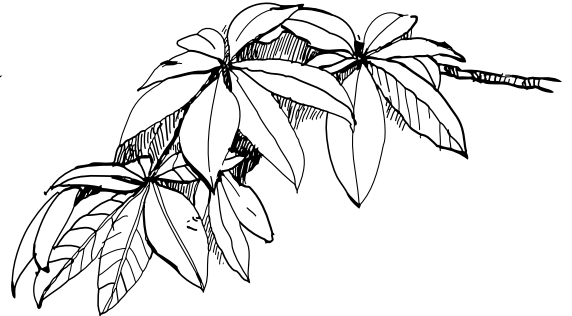
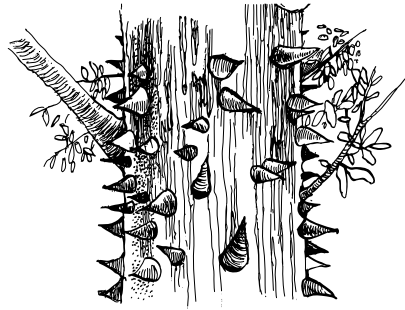
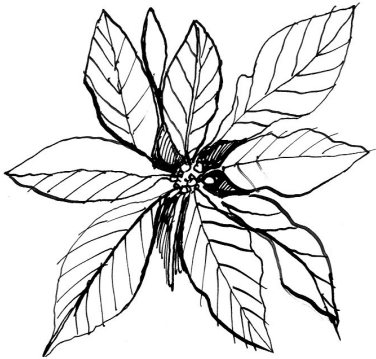


There are no TRF's in Eastern _____. The climate of tropical rain forest is equally humid and warm during the whole year, the total rainfall is between _____ millimetres, the average 24-hour temperature fluctuates between ____ and ____ °C. The microclimates in the different layers of TRF can be very different: on the forest floor the temperature and humidity fluctuate just slightly, in the emergent layer there is direct sunshine which heats and dries it. Climatic conditions are also different in lowland forests (up to 1000 m a.s.l.), mountain ones (1000–2000 m a. s. l.) and cloud forest (2000–3000 m a. s. l.).

3. During the tour in Fata Morgana find the climate figures on the information stands in the exposition of lowland tropical rainforest and complete the exact figures of temperature and humidity.

4. What is characteristic for plants in the TRF? State as many specific features as possible, not less than 3.

5. On the area of 1 ha of TRF there grows a few hundred tree species (the well-known maximum is 400) which can be as tall as 70 meters. The green house's height does not allow planting such giant trees, that is why the understory and canopy layers consist of lower wood plants. We can encounter for example avocado (*Persea americana*), kapok tree (*Ceiba pentandra*) or pachira (*Pachira macrocarpa*). The teacher will help you with their identification as there are no labels which can be seen from the path. But he or she will need descriptions and drawings as detailed as possible. **Choose one of the three pictured wood plants, find it and try to describe it using botanic terminology.**



6. The trunk and root formations of TRF trees are very conspicuous. **On your own choice, do at least two of the tasks marked with a–c. Pick another two from the ones marked with d–f.**



a/ How deep do you think do the roots of trees in TRF's reach? Give evidence for your opinion.



b/ What adjustment could improve the stability of trees in TRF's? Write down all your ideas.



c/ Match the names to the pictures and give reasons for your choice.

pillars

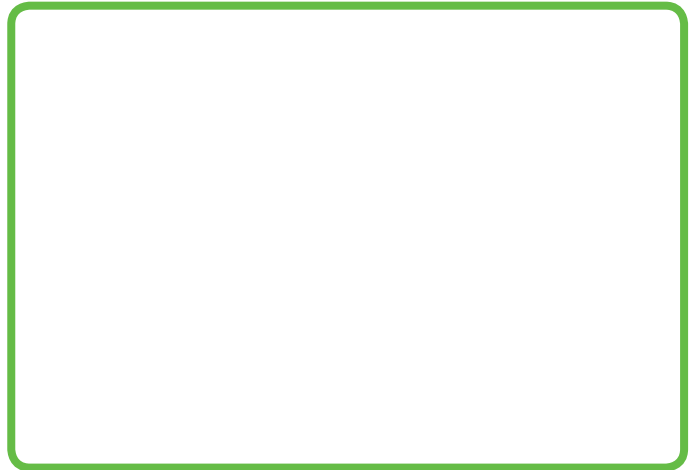
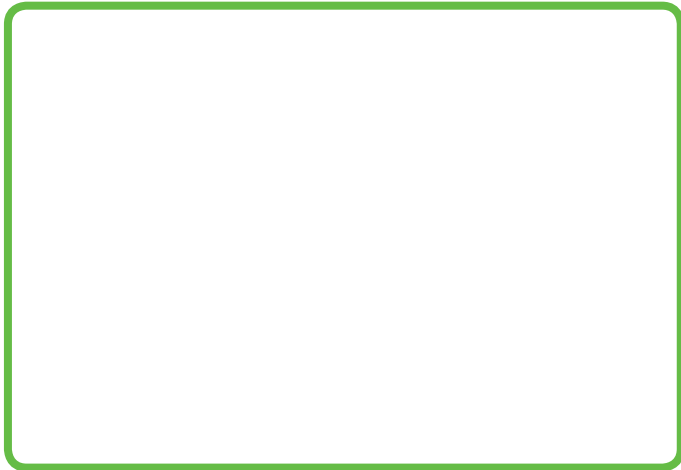
supportive roots

stiltlike roots





d/ Find a wood plant with the stiltlike roots and another one with the supportive roots, draw them and write down their names.



e/ The soil is often very wet in TRF. Lots of trees have adapted themselves to these conditions by creating unusual types of roots.



What do you think these roots serve for?

What would you call this type of roots? .

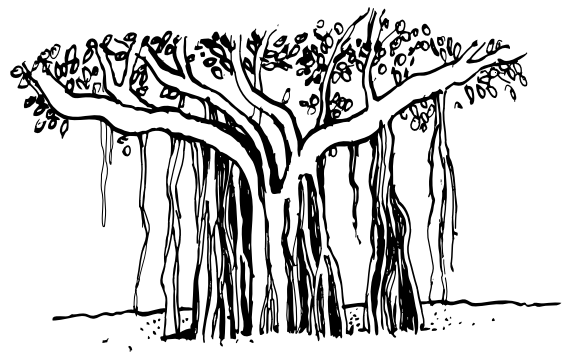
Is there a tree with such roots near the lake?

YES

NO



f/ You can observe one more unusual root type in Fata Morgana – air roots. They usually come from the situation that a plant starts growing on another plant and its roots are sent towards the soil. Find two trees with air roots and write down their names.



7. We can identify particular adjustment to the conditions of TRF on the leaves, blossoms and fruits.
On your own choice, do at least one of the tasks marked with a–c.

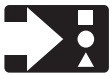


a/ Leaves of the plants in TRF's are very miscellaneous. They can be found with stalks with joints, that enable the leaf to follow the sunshine, or blades with so called drip tips, which make water draining from the leaf's surface easier.

Find a tree that has leaves with drip tips (i.e. lengthened to noticeable tip) put down its name and draw the leaf.



There is one example on the rear wall, if you go past the waterfall.



b/ The blossoms are usually pollinated by animals, which are attracted by means of a wide range of colours, shapes and fragrances. In TRF pollination is carried out not only by insects but also by birds and mammals. **Guess which animal pollinates these blossoms and bring evidence supporting your guess.**

butterfly

fly

bat

hummingbird

beetle



Try to find one more plant with similarly shaped blossoms like *Kohleria's* (in the picture) and write down its name:

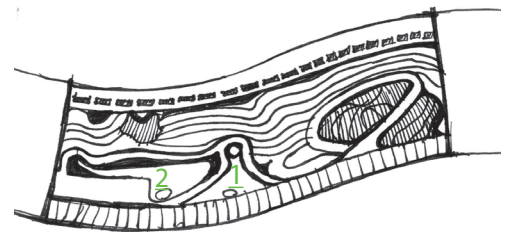


c/ Fruits are variously coloured up, which makes them adjusted to dispersion by animals (zoochory). **Look around and add up how many plants bearing fruit you can see around. What can be the reasons for absence of fruits? Put down all your ideas.**



8. In TRF we can observe several similar types of plants in terms of appearance. However, they belong to different taxonomical groups (spore bearing, gymnospermous, angiospermous).

a/ From the following three tasks do one of your own choice:

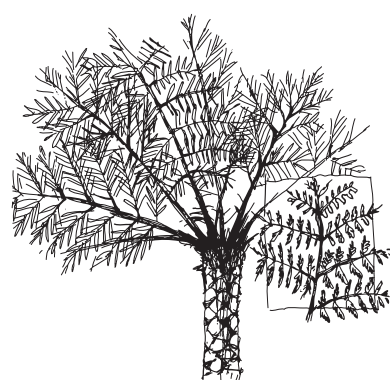


- The name “palm tree” comes from the Latin “palma” (=palm) and refers to the usual shape of palm tree leaves. **Find two representatives of palm trees with palm-like leaves and put down their names.**

- Palm trees and dendriform buckler ferns have some features in common and some differences too. In the central part of tropical exposition right at the pathway there are the palm trees *Dypsis decaryi* and a dendriform

- Palm trees and cycases have some features similar and some different. **Take a detailed look at the cycas in the curve of the pathway leading to the montane part of the green house and describe what features it shares with palm trees.** The fact that both and coniferous trees belong to the group of gymnospermous plants can also serve as a clue.

b/ Match the appropriate names to the pictures: dendriform buckler fern (spore bearing), cycas (gymnospermous), palm tree (angiospermous). Try to find at least one not mentioned species of plant belonging to each group and put its name into the bottom line.



9. A very characteristic feature of TRF is the presence of climbing plants – lianas, epiphytes, which means that the plants do not grow from soil but hold to other plants without parasitizing them.

From the following three tasks do one of your own choice.

a/ Lianas

Write down what advantages the strategy of climbing brings.

In Fata Morgana you can see a plant which creates the longest lianas in the world in the natural conditions. Its name is *Calamus rotang* and you can find it in the central part of the tropical exposition next to the dendriform buckler fern *Cyathea*. Its stalks are covered with remarkable thorns. Guess how long the liana in Fata Morgana is and what it can be used for. The generic name can help...

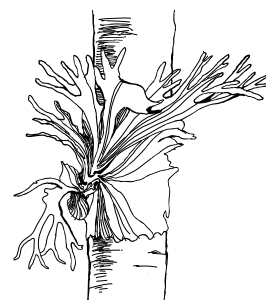


How many other lianas can you count? _____.

b/ Epiphytes

Write down what advantages the epiphyte living strategy brings.

Find at least one epiphyte plant, write down its name and characteristic features.



In Fata Morgana you can also see one specialized type of epiphyte plants which live in symbiosis with ants. In the central part of tropical exposition there is the species *Myrmecodia* growing in the height of 3 meters on the trunk of a dendriform buckler fern *Cyathea* (see No. 1 on the map on p. 4). Find it, write what makes the stalk of the plant unusual and try to draw it. Guess what this adaptation of stalk serves for.

10. Write down what impressed you the most from the tour and outline some questions that come up to your mind concerning the topic: