GROWING PLANT(S) AT THE HABBITAT OR/AND DEDICATED EXTERNAL SPACE. , A. Tomic[2,] L. Authier[1,2,4], A. Blanc[1,2,4] , B.H. Foing[1,2,3] , A. Lillo[1,2,4], P. Evellin[1,2,5], A. Kołodziejczyk[1,2], C. Heinicke[2,3], M . Harasymczuk[1,2], C. Chahla[1,2,5], S. Hettrich[6], [1]ESA/ESTEC & [2]ILEWG (PB 299, 2200 AG Noordwijk, NL, Bernard.Foing@esa.int), [3] VU Amsterdam, [4] Supaero Toulouse, [5] ISU Strasbourg, [6] SGAC

Astrolove, Astrolife, Astrobiology, Exobiology

Let me begin this abstract with one word - spreading. Humanity has made many big, huge steps throughout their time, especially in the last hundred years. Steps in science, physics, astronomy, biology, quantum mechanics and more. Everyday we are trying to solve some puzzles, and by exploring the world around us we actually explore ourselves, and unstoppable process of evolution.

Any form of life in core has two lines of code: eat the host and spread around. If we look even further it seems like the whole known universe is doing the exact same thing - spreading, creating space-time from nothingness, and eating some unknown host, but this subject is too philosophical for our topic.

To make big steps, first we have to learn how to walk, how to make small steps. Actually those small steps are something that we are all making every day, everywhere. This is one of my tiny little astrobiological steps.

Introduction: First of all, I don't believe that humans in current form are able to reach any interstellar distances. Probably genetic and cyber biology will come up with the solutions, but until then we still can try to grow plants in space. This could be of benefit for the human interaction and use, as a: food, additional oxygen, energy source and psychological support, but it will create also possibility for new, unknown branch of the plants evolution.

Phases of research and simulation:

1) In the specialy created exact copy of the Moon soil, which we got from the ESTEC teram, we've planted 3 different seeds. Seeds were couted in the mixture of the clay and minerals.

2) Moon soil was treated in the first two weeks only with a water and LED red-blue light in the daily rhymical way to support and accelerate plants grow.

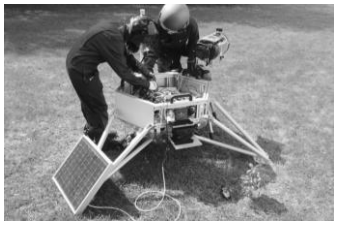
3) After two weeks on the top of waterlight, soil was treated with the additional minerals:
   a. 2.7% azot organic (N)
   b. 1.3% anhydride phosphoric (P2 O5)
   c. 5.9% potassium oxid (K2 O)

Experiment at the Moon Lander:

During the EVA at the Euro Moon Mars – Moon short simulation at the ESA-ESTEC, astronauts have performed spectrometral reading of the plants leaf with the device located at the Moon Lander.

Spectrometer was remotely controlled form the Habitat controlled by Habitat CapCom in the synchonised action and communication with the astronautls outside.

In addition of collection more data, we performed also remote reading of Moon Lander thermometer and hymidmeter.



Data collected in this process first was stored at the Habbitat local data server, and than transferred to the Mission Control for the further analyses.

References: A. Tomic, L. Authier [1,2,4], A. Blanc [1,2,4], B.H. Foing [1,2,3], A. Lillo [1,2,4], P. Evellin [1,2,5], A. Kołodziejczyk [1,2], C. Heinicke [2,3], M . Harasymczuk [1,2], C. Chahla [1,2,5], [2], S. Hettrich [6], [1] ESA/ESTEC & [2] ILEWG (PB 299, 2200 AG Noordwijk, NL, Bernard.Foing@esa.int), [3] VU Amsterdam, [4] Supaero Toulouse, [5] ISU Strasbourg, [6] SGAC