

Submerged aquatic plants (or macrophytes) are important elements of freshwater lotic environments as they occupy key interfaces in these ecosystems. Particularly, complex and fundamental physical and biogeochemical processes occur at the plants-flow-sediment interfaces. On one side the environment (flow and sediment characteristics) influences the growth and distribution of aquatic plants, which, in turn, are ecosystem engineers that actively modify their habitat (for example reducing water velocity and increasing sedimentation within plant patches). Moreover, also nutrient availability in the system may play a key role on the plants-flow-sediment both through modification of plants traits and patch architectural characteristics, which have been individuated as key factors governing the impact of aquatic plants on flow and sediment dynamics.

Our research is focused on three principal questions: 1) how the nutrient availability may affect the plant-flow-sediment interactions and induce feedbacks at the ecosystem scale by altering the plants traits (e.g. morphology and architectural complexity) 2) how aquatic patch characteristics affect the spatial pattern of hydrodynamics, sediment dynamics and nutrient uptake dynamics 3) how the architectural characteristics may influence the plant fitness itself through the plant-flow-interaction and nutrient dynamics. For this study we combined field and flume experiments.



Networking opportunities within the institution (LEHNA):

- Dr. L. Simon for isotopic uptake measurements
- Dr. F. Mermillod-Blondin, for measurement of microbial activity

Networking opportunities within HYTECH (<http://hytech.dii.unipd.it/hytech/>) :

- Dr. T. Bouma (NIOZ, Netherlands), on spatial pattern of biophysical interactions
- Prof. G. Wharton (Queen Mary University, UK), on sediment processes in vegetated stream
- Prof. H. Nepf (MIT, USA), on hydrodynamics processes in vegetated stream.
- Dr. M. Zaramella (WET, Italy), on hydraulic retention time.

This work is supported by the Research Executive Agency, through the 7th Framework Programme of the European Union, Support for Training and Career Development of Researchers (Marie Curie - FP7-PEOPLE-2012-ITN), which fund the Initial Training Network (ITN) HYTECH 'Hydrodynamic Transport in Ecologically Critical Heterogeneous Interfaces', N.316546.