Geophysical Research Abstracts,
Vol. 10, EGU2008-A-04349, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-04349
EGU General Assembly 2008

Preliminary assumption of sulphur-oxidizing bacterial symbiosis by Raman microspectrometry: an application on mangrove swamp meiofauna of Guadeloupe (F.W.I.)

L.C. Maurin (2), D. Himmel (1), J.L. Mansot (1), M.C.Z. Laurent (2) and O. Gros (2)

(1) GTSI Université des Antilles et de la Guyane, Guadeloupe, France.

(2) UMR-CNRS 7138 SAE équipe « Symbiose » Université des Antilles et de la Guyane, Guadeloupe, France (leslie.maurin@univ-ag.fr / Fax: (590) 590 48 32 81 / Phone : (590) 590 48 33 06)

Among various techniques permitting the detection of elemental sulphur, Raman microspectrometry can be used. Due to the high intensity of the sulphur S8 Raman bands, this technique a high sensitivity. In our case, it allows us to detect quickly the extracellular or intracellular presence of elemental sulphur compounds. Moreover, this technique can be used on living organisms (without preliminary fixation) preserving the molecular structure of the sulphur.

In mangrove swamp (Guadeloupe) the sulphur speciation of meiofaune colonizing the sunken wood has been determinated by this technique. The description of *Zoothamnium niveum* (ciliates) as a model of sulphur-oxidizing bacterial symbiosis (Bauer-Nebelsick *et al*., 1996ab; Rinke *et al*., 2006) permits to compare spectra obtained by Raman microspectrometry on the different organisms collected from this ecosystem. The observation of elemental sulphur S_8 on this biological model associated with electronic microscopy analyses such as scanning electron microscopy (SEM) and transmission electron microscopy (TEM) observations allows us to highlight the symbiotic sulphur-oxidizing association. The detection of sulphur by Raman microspectrometry was realized on ectosymbiotic organisms such as nematodes (*Eubostrichus di-*

anae), kamptozoans (*Loxosomatoides sp*.) and ciliates (*Vorticella sp.*) but also on an endosymbiotic nematode (undetermined species).

This fast and easy technique can be considered as a powerful tool for preliminary assumption of sulphur-oxidizing symbiosis in meiofauna. This implement can be used without constraints for the organism size, the study can be realized on entire living meiofaune organisms (<1mm) or on part of individual dissected.

Reference:

Bauer-Nebelsick, M., Bardele, C.F., and Ott, J.A. (1996) Redescription of *Zoothamnium niveum* (Hemprich & Ehrenberg, 1831) Ehrenberg, 1838 (oligohymenophora, peritrichida), a ciliate with ectosymbiotic, chemoautotrophic bacteria. European Journal of Protistology 32 (1), 18-30.

Bauer-Nebelsick, M., Bardele, C.F., and Ott, J.A. (1996) Electron microscopic studies on *Zoothamnium niveum* (Hemprich & Ehrenberg, 1831) Ehrenberg 1838 (Oligohymenophora, Peritrichida), a ciliate with ectosymbiotic, chemoautotrophic bacteria. European Journal of Protistology 32 (1), 202-215.

Rinke, C., Schmitz-Esser, S., Stoecker, K., Nussbaumer, A.D., Molnar, D.A., Vanura, K., Wagner, M., Horn,M., Ott, J.A., and Bright, M. (2006) « *Candidatus* Thiobios zoothamnicoli », an ectosymbiotic bacterium covering the giant marine ciliate *Zoothamnium niveum*. Applied and environmental microbiology 72(3), 2014-2021.