fed fish. Oxygen uptakeat 12 weeks in fed or fasted fish exposed to a P-gp substrate (Rhodamine 123) only or induced with clotrimazole only were not affected, however, fed or fasted fish with induced P-gp levels and then exposed to the P-gp substrate exhibited increased respiration rates. In summary, prolonged fasting affects the ability of fish to efflux xenobiotics, and in addition, when P-gp is operating at maximum levels, energetic costs may be substantial.

TU097

Toxicity Assessment of Ashes from Tropical Savanna Wildfires to Aquatic Biota

D. Brito, University of Brasilia / Biology; C.J. Passos, University of Brasilia; E.C. Oliveira-Filho; Z. Malena, University of Brasilia

Fire plays an important ecological role in tropical savannas, meanwhile climate change scenarios predicts an increase in the frequency and severity of wildfires worldwide, mainly in those zones. The effects of forest fires on vegetation cover, catchment erosion and their detrimental effects on different environmental matrixes have been well documented, however very few studies have examined the potential ecotoxicological effects of wildfire on aquatic organisms in tropical zones. We investigated the effects of ash from three different areas (two native vegetation areas and a pasture area - a landuse type very susceptible to wildfires in Brazil) through ecotoxicological bioassays using three aquatic species from distinct trophic levels: microcrustacean *Ceriodaphnia dubia*, fish *Danio rerio* and the mollusc *Biomphalaria glabrata*. Ashes (leaves, wood and bark) were collected in burnt areas, prepared the solution (100g.L^{-1}) in culture water and mixed for 96hrs for different dilutions (3.12-100%). The results showed that there was a difference in acute toxicity among different ashes. All ashes showed toxicity to *C. dubia*. In relation to *D. rerio* and *B. glabrata* tests, no acute toxicity was observed when they were exposed to ashes from pasture and native vegetation. Only an area showed toxicity for *D. rerio* (LC_{50} (24hs): 31.50%; LC_{50} (48hs): 25.0%). The ashes mixed for long period (30 days) caused acute toxicity to *B. glabrata* (LC_{50} (24hs): 50.0% (37.7- 66.4); LC_{50} (48hs): 35.4%). Ash increased the pH (>10) in the test solution, however the serial dilutions minimized pH effects. The toxic effects were still evident indicating that components of ashes (e.g., metals) represent an important factor in the overall toxicity of vegetation ash. These results demonstrate that fires influence the toxicity of surface waters, making it toxic to the survival of aquatic organisms, specially zooplankton communities, and emphasize the need for more studies in order to understand the complexity of the ecological effects of fire on aquatic communities. \n

TU098

Impacts of contaminants on metabolic capacities in American and European yellow eels

A. Caron, INRS / Centre Eau Terre Environnement; M. Baudrimont, Université Bordeaux1; H. Budzinski, P. Labadie, University of Bordeaux / UMR EPOC Equipe LPTC; F. Pierron, CNRS; P. Couture, INRS / Centre Eau Terre Environnement

Since the 1980's, both European (*Anguilla anguilla*) and American (*Anguilla rostrata*) eel populations have drastically declined. Several factors likely contributed to this decline, including overfishing, climate change and obstacles to migration, but recent studies suggest that contamination also plays a role. The objective of this study was to examine the relationships between eel contamination and a range of enzyme indicators of various metabolic capacities. To this end, European yellow eels were sampled in two clean and two contaminated sites in France and the same design was repeated in the province of Québec (Canada) for American eels. We measured the concentrations of inorganic contaminants (Ag, As, Cd, Cr, Cu, Hg, Pb, Ni, Se and Zn) in liver and muscle and of organic contaminants (Sum of OCPs, sum of PCBs, and sum of PBDEs) in muscle. As indicators of aerobic capacities, we measured the activities of the mitochondrial enzymes citrate synthase (CS) and cytochrome C oxidase (CCO), while the activity of lactate dehydrogenase (LDH) was used as an indicator of anaerobic capacities and that of pyruvate kinase (PK) served to estimate glycolytic capacities. We also measured glucose-6-phosphate dehydrogenase (G6PDH), involved in lipid and antioxidant metabolism. In *A. rostrata* liver, CS activity was strongly and positively correlated with Pb contamination, while negative correlations were observed between G6PDH and Ag and between LDH and Ni. In muscle, correlations between PK (+), CS (-) and CCO (-) activities and Hg concentrations were observed. Also, a positive correlation was found between PK and PCBs, while strong negative correlations between both CS and CCO were observed with OCPs, PCBs and PBDEs. In *A. anguilla* liver, PK was positively correlated and CS negatively correlated with Pb concentrations. In muscle, PK and LDH activities were negatively correlated with As and Se respectively. Finally, CS, CCO and LDH did respectively show negative correlations with OCPs, PCBs and PBDEs. Overall, our study suggests that several of the contaminants investigated affect metabolic capacities of yellow eels of both species. Given the importance of aerobic and anaerobic capacities for locomotion, feeding and migration, the results of this investigation add to a growing body of evidence that environmental contamination plays a role in the decline of Atlantic eels.

TU099

Aromatase and vitellogenin mRNA expression in an endangered fish species (Anguilla Anguilla) from the Loire estuary (France) : relationships with PCB contamination

I. Blanchet-Letrouve, l. poirier, MMS EA; A. ZALOUK-VERGNOUX, Univeristé de Nantes; A. Lafont, Muséum National dHistoire Naturelle; S. Baloche, Muséum National d'Histoire Naturelle; S. Dufour, Muséum National d'Histoire Naturelle / UMR BOREA; C. Mouneyrac, Université Catholique de lOuest / MMS EA

Estuarine zones are extremely fragile due to increasing stress from anthropogenic activities. Among those, the Loire estuary (France) is potentially exposed to various contaminants including Endocrine Disruptors Compounds (EDCs) able to impact the reproduction physiology of fish. Even if the European eel (*Anguilla anguilla*) is not the most suitable sentinel species among Teleosts, this study aimed to investigate whether it may still be the target of estrogenic disruption, which could contribute to the decline of this species. Among the different molecules involved in reproductive function, vitellogenin (Vg) and aromatase (Arom) were of great interest because alterations in their expression could sign disruptions in sexual development. Quantitative real-time Reverse Transcription Polymerase Chain Reaction (q RT PCR) was used in this study to amplify responses of hepatic Vg and Arom transcripts in liver. European eels (*A. anguilla*) were sampled in May 2009 (N=57) and November 2010 (during the downstream migration, N=10) in two sites of the Loire estuary (upstream: Varades; downstream: Nantes). Reproductive (gender, sexual maturity stage) and biometric parameters of collected eels were determined. While only female silver eels should express hepatic Vg mRNA, abnormal levels were also detected in a large proportion (38%) of the other individuals: undifferentiated, yellow females, yellow and silver males. The principal component analysis performed between biometric parameters, Vg and Arom mRNA expression and PCB burdens revealed that Vg was not correlated to a sexual maturation stage, neither to the levels of PCBs. Arom mRNA seemed to occur in the early stage of gonadal maturation and was detected in the liver of 12 out of 67 organisms. Its expression was correlated to the dl and ndl-PCB of the muscles expressed in lw. Further investigations on other environnmental estrogenic EDCs are needed in order to explain the unusual Vg expression.

TU100

Fate of PCBs during developmental and sexual maturation of European eel (Anguilla anguilla)

I. Blanchet-Letrouve, MMS EA; M. Couderc, Universite de Nantes; A. ZALOUK-VERGNOUX, Univeristé de Nantes; P. Elie, CEMAGREF / Unité "Ecosystèmes Estuariens et Poissons Migrateurs Amphihalins"; C. Herrenknecht, University of Nantes / MMS EA; S. Dufour, Muséum National d'Histoire Naturelle / UMR BOREA; B. Le Bizec, ONIRIS / LABERCA; C. Mouneyrac, Université Catholique de lOuest / MMS EA; l. poirier, MMS EA

Among estuarine fish species, European eel (*Anguilla anguilla*) is emblematic and recognized as an endangered species, listed in Annex II of the Convention on International Trade in Endangered Species. Its population is considered to be outside safe biological limits on account of overfishing, climate change, habitat reduction, hydraulic barriers, diseases and parasitic infection and pollutant exposure. This fatty species is characterized by a high bioaccumulation potential for organic pollutants such as Endocrine Disrupting Compounds (EDCs), which may impair eel reproduction and further threaten their population The objective of the present study was to investigate potential metabolic correlations during the silvering process comparing the PCB contamination levels in immature organisms such as glass eels and yellow eels and in potential genitors. PCB contamination levels of both gonads and muscles of yellow and silver eels from the Loire estuary have been compared in function of age class (6-10 y; 10-13 y; >13 y). The immature yellow gonads appeared two fold higher contaminated than the muscles for dl and ndl PCBs (expressed in wet weight (ww) and in dry weight (dw)) in yellow eels belonging to the age class 6-10 y. This result could be explained by the lipid weight of the gonads. For silver eels belonging to the 6-10 and 10-13 age classes, ndl PCB levels of gonads were significantly higher than those of muscles whatever the unit expression. Moreover, strong correlations between PCB levels of gonads and muscles in silver eels expressed in lw were found for each analyzed congener (except for PCB 81), whereas no correlation was found in yellow eels. These results highlighted significant correlations between the gonad and muscle lipids during the growing phase of silver eels. A mean contamination level of 18.5 ng $TEQ_{WHO\ 1998}$.kg^{-1} of gonad expressed in ww was obtained, suggesting a potential risk of abnormalities during the embryogenesis. The PCB patterns varied among the different developmental stage and matrices. The non metabolizable congeners 126 and 169 seemed particularly associated to the silvering process. Their constancy in glass eels could also sign a exchange of these contaminants during the hatching, from oocyte yolk to embryos, suggesting a materno foetal transfer.

TU101

TOXICITY OF IMPROPERLY DISCARDED PHOTOVOLTAIC PANELS

R. Panzuto, Biologia; B. Avallone, University Federico II of Naples; R. Cerciello, University of Naples Federico II / Biology; V. Mazzella, University of Naples Federico II / Biologia; M. Trifuoggi, University of Naples Federico II / Scinze chimiche; C.M. Motta, University Federico II of Naples / Department of Biology

The exploitation of solar energy is considered one of the possible solutions to the increasing energy demand and for this reason the use of photovoltaic cells (PVC) has progressively increased in the last thirty years. First commercially available PVC have been installed in the early '80; they are now at the end of their life and need to be dismissed, a costy procedure due to the potential toxicity of their