



# Freshwater Animal Diversity Assessment (FADA):

An Assessment of Animal Diversity in the Continental (Fresh) Waters of the World





# Freshwater Animal Diversity Assessment (FADA) *Rationale*

- FW biodiversity: overlooked in global conservation initiatives and publications (Dudgeon, et al., 2006)
- A need to provide quantitative estimates of FW biological diversity for conservation purposes: you cannot adequately protect what you don't know
- A global assessment of FW biodiversity: a real challenge (complexity of FW ecosystems, multiple uses..)





# Freshwater Biodiversity Paradox

- An outstanding diversity in such a restricted habitat :
  - **FW = 0.01% of world water**
  - **FW = 0,8 % of earth surface**
  - **FW BD = 6% of all described species**
  - **FW BD = 40% of total fish**
  - **FW BD = 1/4 of total vertebrates**
- A valuable resource...not just for scientists!
- Cultural and socio-economic issues: agriculture, aquaculture, traditional uses, food sources, aesthetics...



# FADA

## *Objectives*



- Compile existing information on animal species and generic diversity in the continental waters of the world = the databases.
- Focus on taxonomic and biogeographic diversity:
  - give current numbers of known global species and generic diversity
  - identify current biogeographic distribution
  - highlight main areas of endemism
- Emphasize phylogeny and processes of evolution and speciation



# FADA

## *Activities*

➤ Preliminary Phase : Literature review and compilation of online data sources (2002 /2003):

**Lévêque C., E.V.Balian, K. Martens, 2005.  
An assessment of animal species  
diversity in continental waters.  
Hydrobiologia, 542: 39-67**





## Preliminary Phase

<b>Group</b>	<b>Lévêque et al 2005</b>
<b>Porifera</b>	<b>197</b>
<b>Gastrotricha</b>	<b>ca 250</b>
<b>Rotifera</b>	<b>1817</b>
<b>Mollusca</b>	<b>ca 5000</b>
<b>Crustacea</b>	<b>ca 10060</b>
<b>Arachnida</b>	<b>5000</b>
<b>Insecta</b>	<b>&gt; 50400</b>
<b>Fish</b>	<b>13400</b>
<b>Amphibia</b>	<b>5504</b>
<b>TOTAL</b>	<b>C 100,000</b>

# FADA

## *Activities*

- Preliminary Phase : Literature review and compilation of online data sources (2002 /2003):  
Lévêque C., E.V.Balian, K. Martens, 2005. An assessment of animal species diversity in continental waters. *Hydrobiologia*, 542: 39-67
- Phase 1: Expert assessment - ca. 50 world experts of freshwater animal groups provide an assessment of their group at a meeting in Mechelen (2005, Belgium)

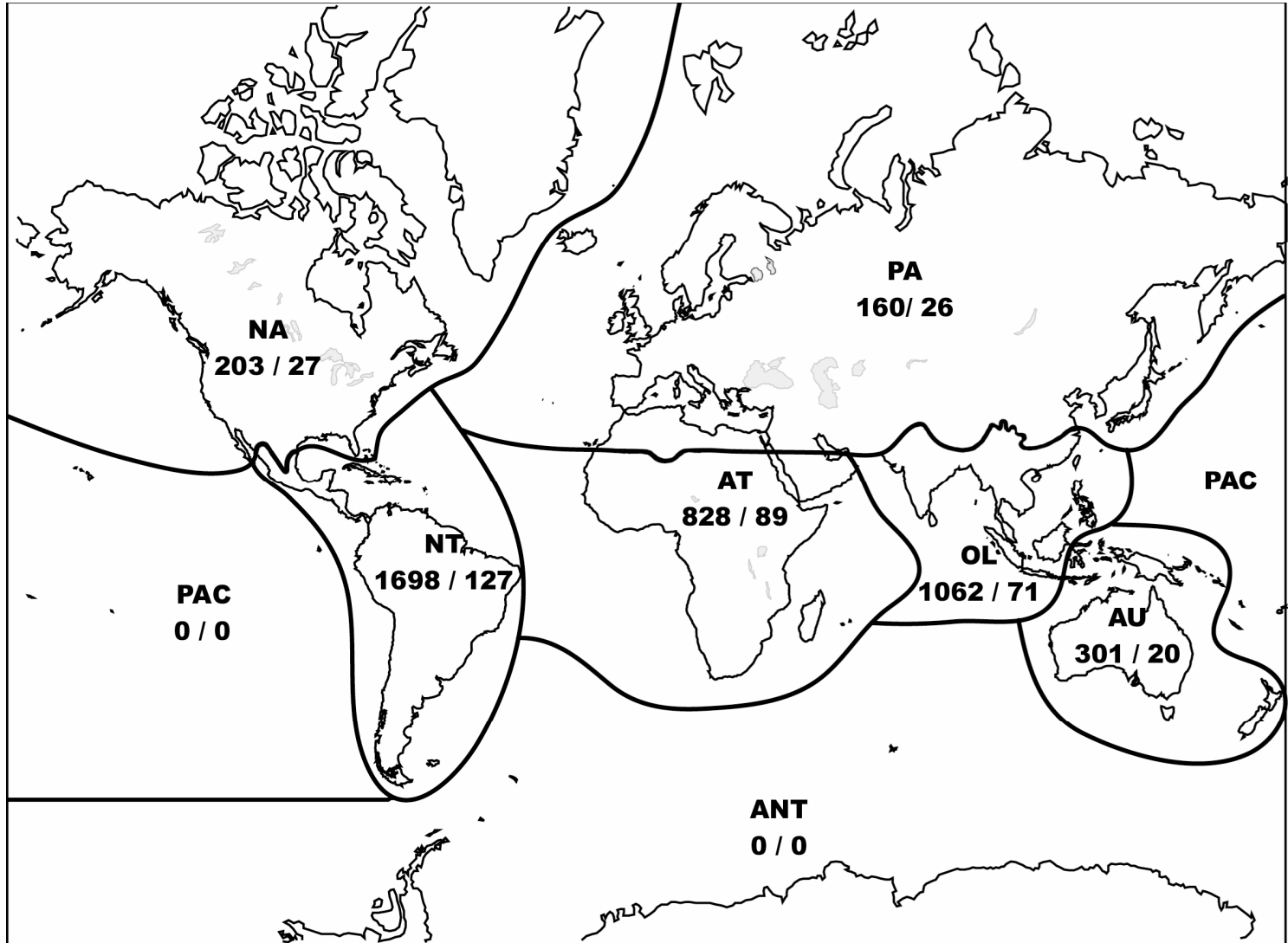
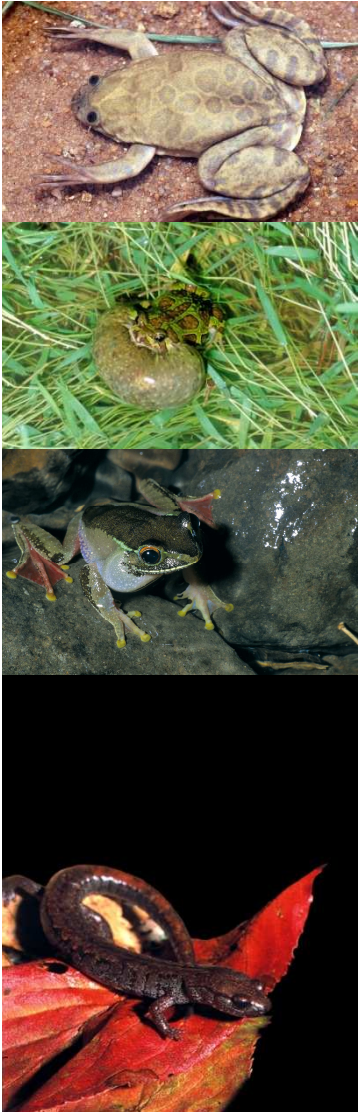




## Phase 1: Expert contributions Uniformize chapters

- Subspecies= species
- Aquatic vs water dependent
- Free living vs parasitic
- Include genera
- Zoogeographical regions, not continents
- ....



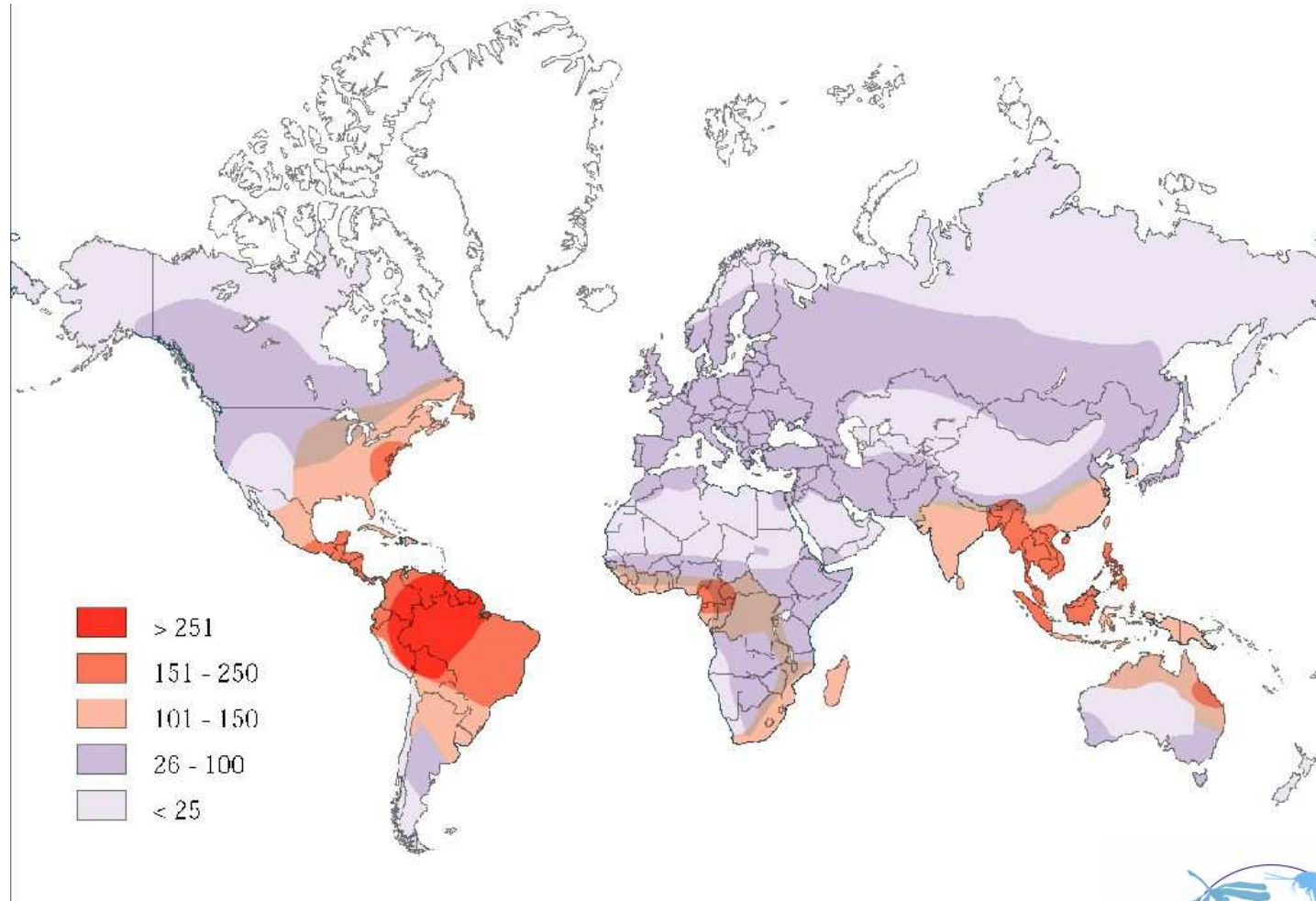


Map showing specific and generic diversity of **aquatic amphibian species** by major zoogeographic divisions. Numbers include amphibian species with at least one aquatic life-history stage plus those strongly related to water (e.g. some direct-developing species). PA – Palearctic ; NA – Nearctic; NT – Neotropical; AT – Afrotropical ; OL – Oriental; AU – Australasia; PAC – Pacific Oceanic Islands; ANT- Antarctic



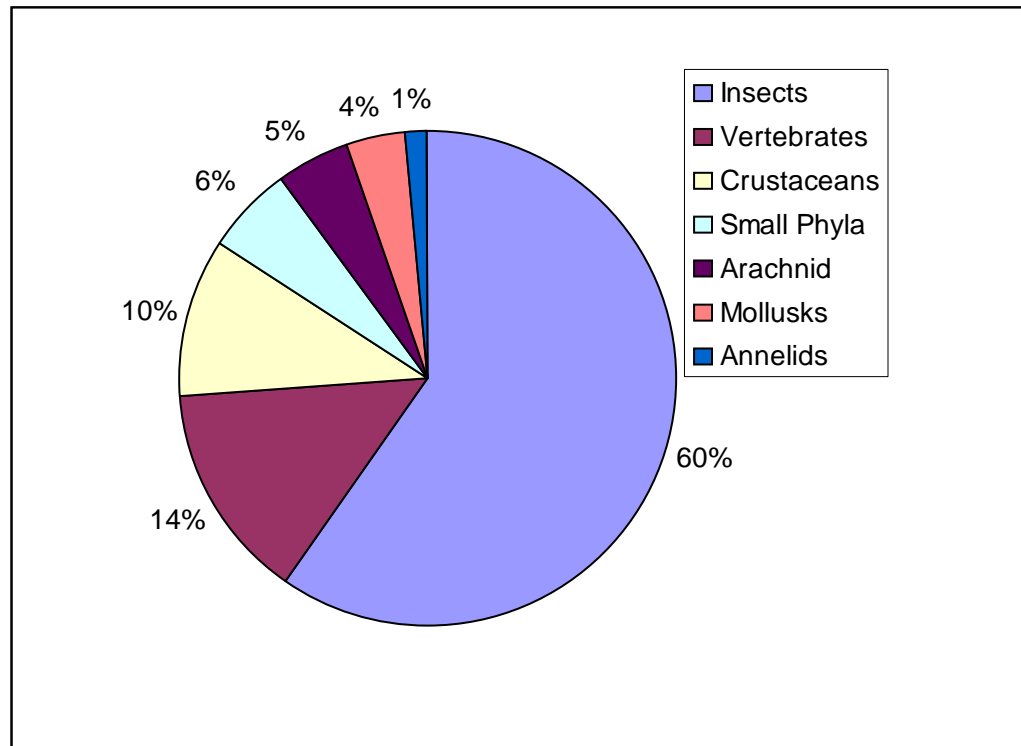


# Species diversity of Odonata: diversity hotspots

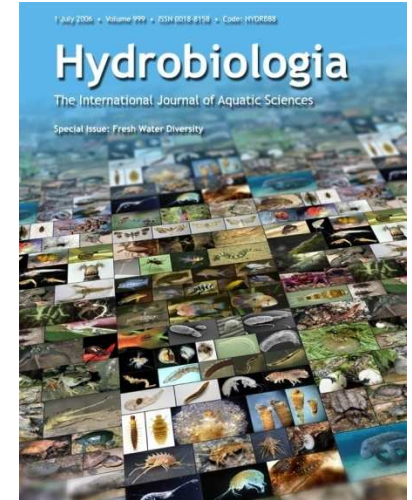




World number of FW species	
Insects	75908
Vertebrates (70% Fish)	18238
Crustaceans	13054
Small Phyla	7227
Arachnid	6149
Mollusks	4998
Annelids	1761
<b>Total</b>	<b>127749</b>



# 1. FADA *Activities*



- Preliminary Phase : Literature review and compilation of online data sources (2002 /2003):
- Phase 1: Expert assessment
- Phase 2: Special issue of Hydrobiologia  
Published January 2008

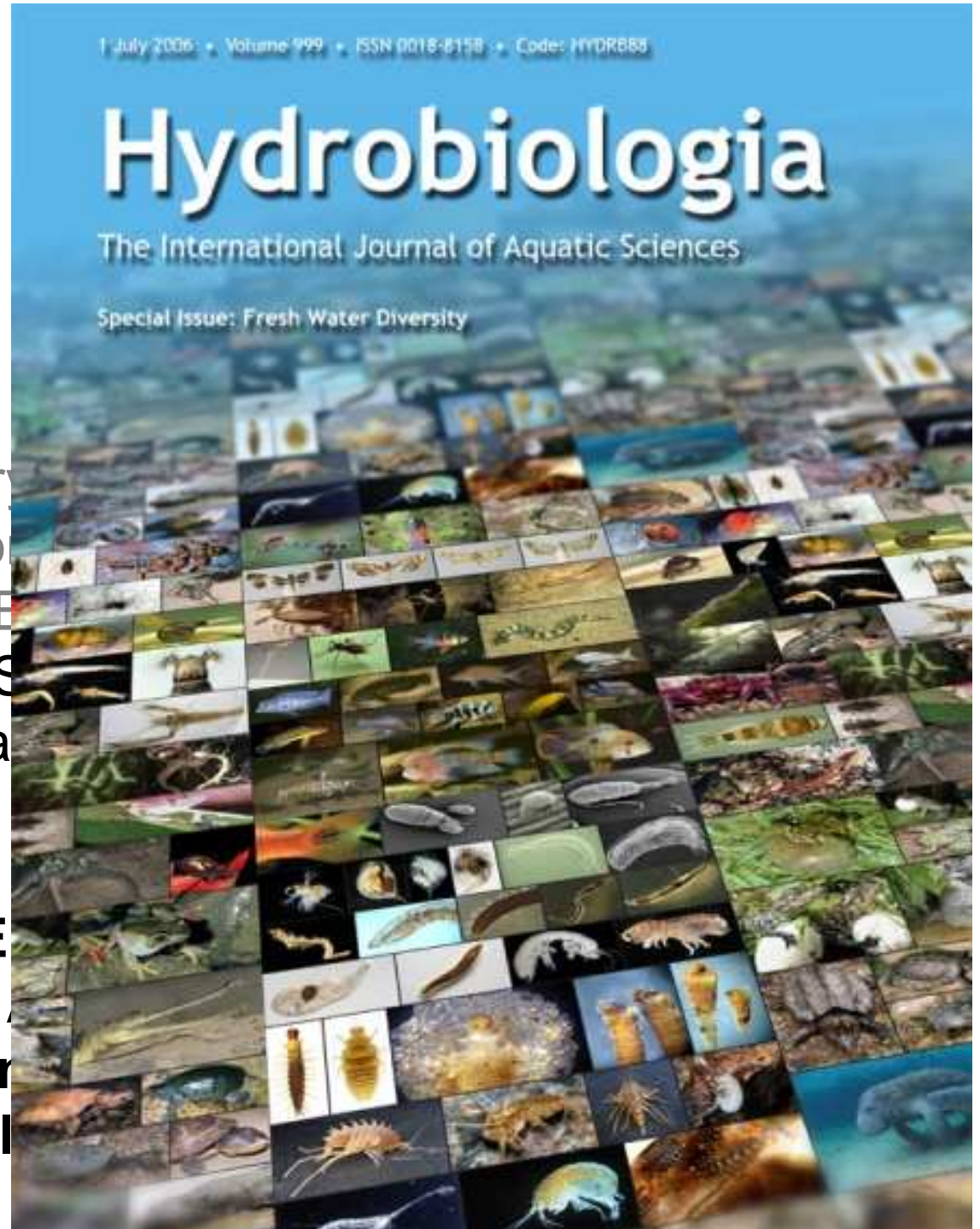
**BALIAN, E., C. LÉVÊQUE, H. SEGERS & K.MARTENS, 2008. Freshwater Animal Diversity Assessment. Hydrobiologia 595: 637 pp. Reprinted as Developments in Hydrobiology 198.**





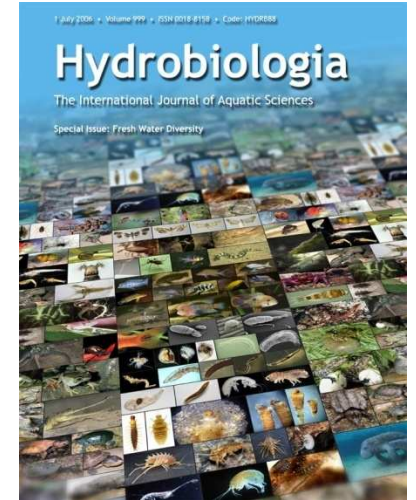
- Preliminary compilation
  - Phase 1: E
  - Phase 2: S
- Published Jan

**BALIAN, E.,  
K.MARTE**  
**Diversity**  
**pp. Reprin**  
**Hydrobiol**





# FADA *present workshop*



- FADA 3: Valorisation of FADA 1 results and data :
- We need questions: biological, conservation,...
  - We need tools to address these questions
  - We need compatible databases for the meta-analyses to address these questions





# FADA

## *Future activities*

- FADA 3: Valorisation of FADA 1 results and data :
  - ⇒ workshop in Belgium December 2008
    - ⇒ draft all databases
    - ⇒ Identify general questions
    - ⇒ identify/ develop analytical tools
  
- FADA 4: Establishment of a Freshwater Biodiversity Consortium (FBiC) including Species 2000, FishBase, IUCN, WWF Freshwater Eco-regions, The Nature Conservancy...
  - BIOFRESH: application for network in FP7 (EU) (coord.: Klement Tockner)



# Acknowledgements

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**Thank you for  
coming to  
Bruges!!**