

BIG4 field workshop

June 5-11 2016, Havraníky, Czech Republic



BIG4 insect groups

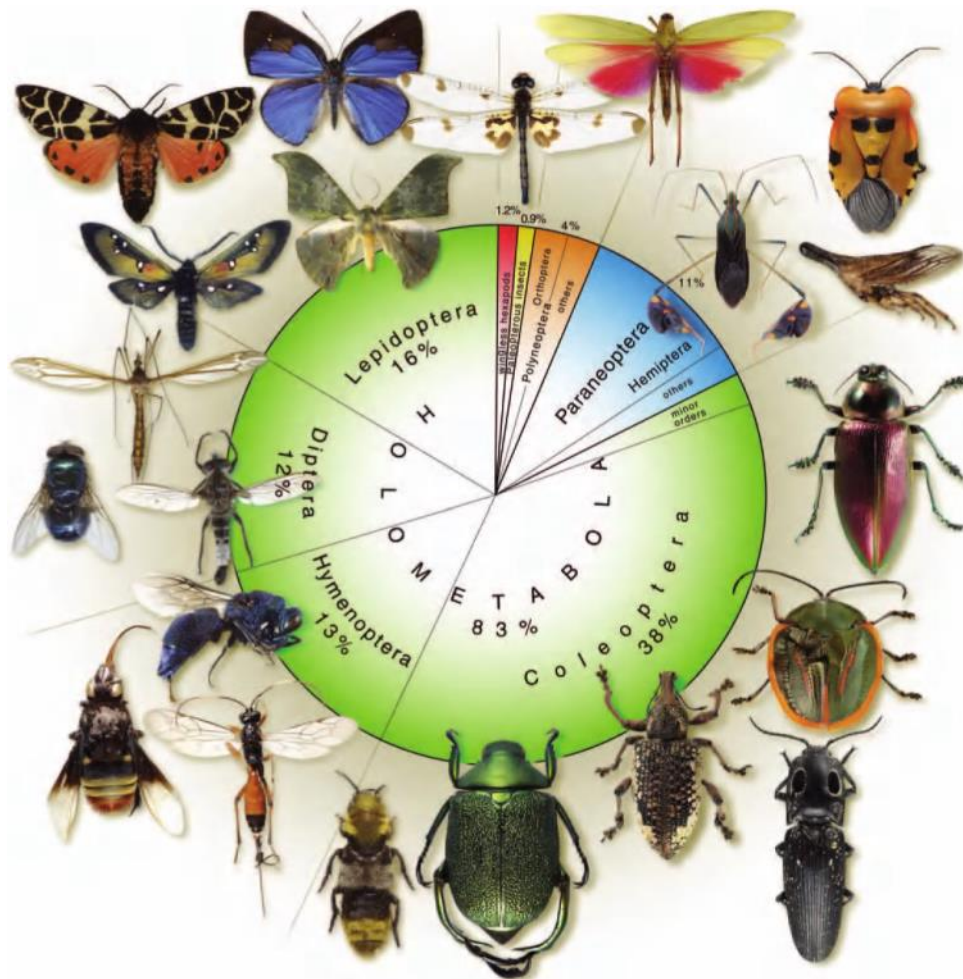


TABLE 1.1. Numbers of Described Species of Extant Hexapods

Wingless Orders:	Species
Entognatha:	
Protura	600
Collembola	9,000
Diplura	1,000
Archaeognatha	500
Zygentoma	400
Paleopterous Orders:	
Ephemeroptera	3,100
Odonata	5,500
Polyneopterous Orders:	
Grylloblattodea + Mantophasmatodea	41
Phasmatodea	3,000
Orthoptera	20,000
Dermaptera	2,000
Embiodea	500
Plecoptera	2,000
Zoraptera	32
Dictyoptera:	
Blattodea	4,000
Mantodea	1,800
Isoptera	2,900
Paraneoptera:	
Psocoptera	4,400
Phthiraptera	4,900
Thysanoptera	5,000
Hemiptera	90,000
Holometabola:	
Neuropterida	6,500
Coleoptera	350,000
Strepsiptera	550
Mecoptera	600
Siphonaptera	2,500
Diptera	120,000
Hymenoptera	125,000
Trichoptera	11,000
Lepidoptera	150,000
Approximate Total	926,400

“Big four”:

- Coleoptera (beetles)
- Lepidoptera
- Hymenoptera
- Diptera

BIG4 insect groups

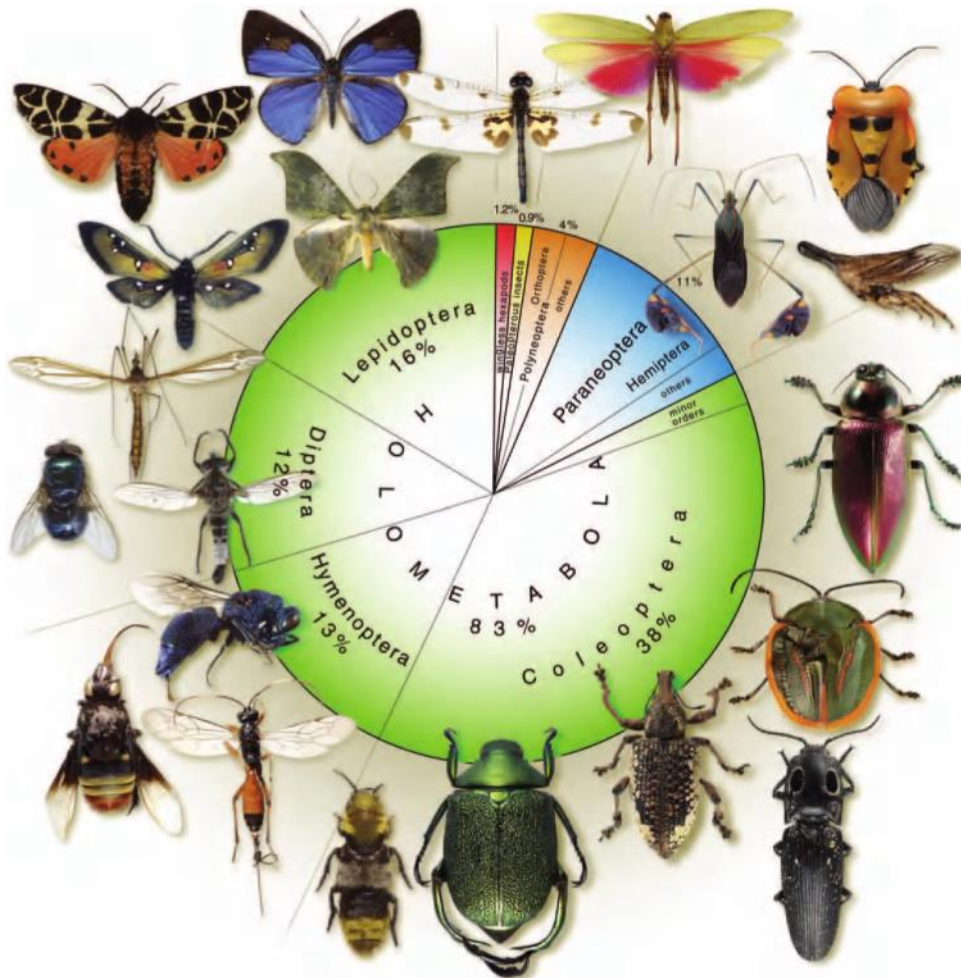


TABLE 1.1. Numbers of Described Hexapods

Wingless Orders:

Entognatha:
Protura
Collembola
Diplura
Archaeognatha
Zygentoma

Paleopterous Orders:

Ephemeroptera
Odonata

Polyneopterous Orders:

Grylloblattodea + Mantophasmatoidea
Phasmatodea
Orthoptera
Dermaptera
Embiodea
Plecoptera
Zoraptera
Dictyoptera:
Blattodea
Mantodea
Isoptera

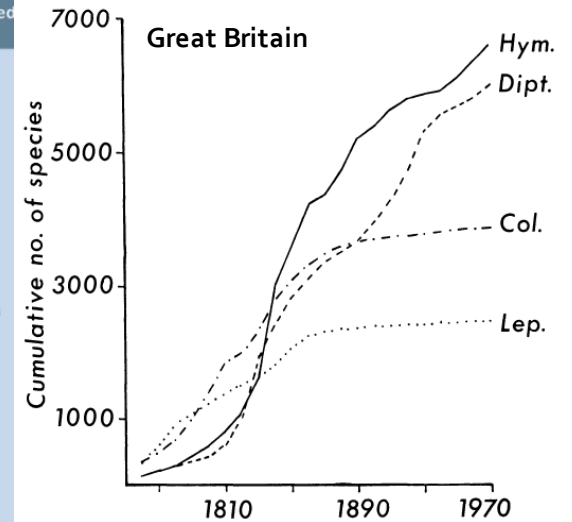
Paraneoptera:

Psocoptera 4,400
Phthiraptera 4,900
Thysanoptera 5,000
Hemiptera 90,000

Holometabola:

Neuropterida 6,500
Coleoptera 350,000
Strepsiptera 550
Mecoptera 600
Siphonaptera 2,500
Diptera 120,000
Hymenoptera 125,000
Trichoptera 11,000
Lepidoptera 150,000

Approximate Total 926,400



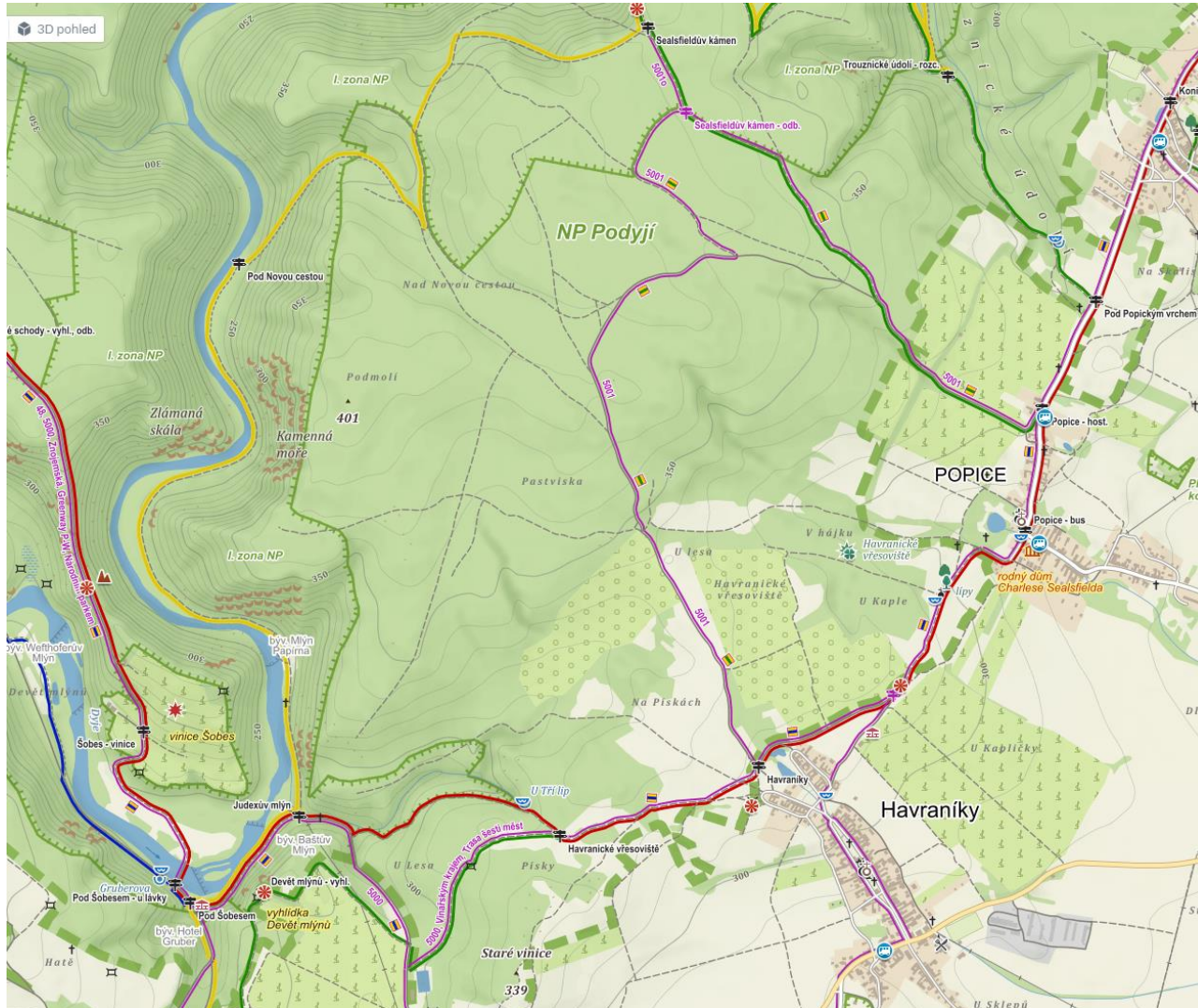
(from Gaston 1991)

“Big four”:

- Coleoptera (beetles)
- Lepidoptera
- Hymenoptera
- Diptera

The goal of the workshop

GOAL:
Species inventory of an
area around the
Havraníky village



The goal of the workshop



	Coleoptera	Lepidoptera	Hymenoptera	Diptera
Morphospecies				
Of that identified to genus or species				

Results



	Coleoptera	Lepidoptera	Hymenoptera	Diptera
Morphospecies	196	331	235	48 families
Of that identified to genus or species	136	331	52	24

Problems we faced

- Time consuming + needs previous knowledge/expertise
- Keys too complex:
 - Complex terminology
 - Sometimes they ask about characters I cannot see in my specimen
 - Too many characters have to be considered at one moment
- Absence of pictures (habitus + details of diagnostic characters) – except in Lepidoptera: only pictures, no keys
- Keys written in local languages (German, Czech)

Usual way of study...

1. Field work – collecting of specimens/material
2. Raw presorting of collected material (e.g. into orders or families).
3. Sorting of samples into groups of morphologically similar specimens (“morphospecies”).
4. Identification of each species based on literature (e.g. Identification keys ...) and the comparison with identified specimens in museums.
5. If there is no literature or identification is not reliable: comparison with original description and the type specimens
6. If new species are discovered: description/naming of new species.

Field worker

Taxonomist

What about a quicker approach...?

1. Field work – collecting of specimens/material
2. Raw presorting of collected material (e.g. into orders or families).
3. Sorting of samples into groups of morphologically similar specimens (“morfospecies”).
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Parataxonomist

What about a quicker approach...?

1. Field work – collecting of specimens/material
2. Raw presorting of collected material (e.g. into orders or families).
3. Sorting of samples into groups of morphologically similar specimens (“morfospecies”).

Parataxonomist

- ~~4. Identification of each species based on literature (e.g. Identification keys ...) and the comparison with identified specimens in museums.~~
- ~~5. If there is no literature or identification is not reliable: comparison with original description and the type specimens~~
- ~~6. If new species are discovered: description/naming of new species.~~

What about a quicker approach...?

1. Field work – collecting of specimens/material **Parataxonomist**
2. Raw presorting of collected material (e.g. into orders or families).
3. Sorting of samples into groups of morphologically similar specimens (“morfo-species”).

Sample 007/2010

Helophorus aquaticus
Helophorus nubilus
Hydrochus carinatus
Spercheus emarginatus
Laccobius atratus
Laccobius minutus
Laccobius striatulus
Enochrus bicolor
Enochrus coarctatus
Hydrochara flavipes
Hydrophilus piceus
Coelostoma orbiculare

Sample 007/2010

Helophoridae sp. 1
Helophoridae sp. 2
Hydrochidae sp. 1
Spercheidae sp. 1
Hydrophilidae sp. 1
Hydrophilidae sp. 2
Hydrophilidae sp. 3
Hydrophilidae sp. 4
Hydrophilidae sp. 5
Hydrophilidae sp. 6
Hydrophilidae sp. 7
Hydrophilidae sp. 8

Sample 007/2010

sp. 1
sp. 2
sp. 3
sp. 4
sp. 5
sp. 6
sp. 7
sp. 8
sp. 9
sp. 10
sp. 11
sp. 12

Pros and cons of parataxonomy

PROS

- **speeds up treatment of samples** – not slowed down by needs to compare with historical material
- **allows to involve local people**
- **facilitates to get the information on biology** – we can recognize the “species” and immediately study its biology
- **in some cases provides good data for ecological studies** - if sorting is done by skilled parataxonomists following well-done keys and identification guides
- **it is the only possibly method for some studies** – e.g. raw comparison of diversity between different habitats/biomes

CONS

- **its not possible to verify the identification** – no reference to type specimen
- **voucher specimens are frequently not kept** - impossible to verify even by re-sorting
- **number of species with a big bias (up to 100%)** – similar and closely related species not recognized
- **provided rather unreliable data for most biodiversity studies, cannot be used for:**
 - inventories (we cannot say which species we have in the samples)
 - biogeographic studies (same species is called differently in studies from different places/areas)
 - autecology (we dont know whether we study one species, two species or half of the species)
 - nature protection (number of species is not enough, we need to know about important/endangered species in the protected area)
 - phylogenetics (makes no sense to study how related are unknown species)