Social networks in biodiversity research

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Co-authorship among research institutions

In the period from 2006-2011 a group of 28 biodiversity research institutions in Europe was funded by the European Commission to build a science infrastructure network called EDIT. It was clear that this group had a political and infrastructural critical mass and interests. We wanted to know if the partners also make up a research community. Here fore we study their scholarly communication practices. We used co-authored papers with at least two authors from EDIT institutions for the years 2005-2008 to map a relational network of EDIT partners. One of the questions studied was the degree centrality of each partner in the network (Fig 1 and Table 2).

Degree centrality tells us with how many members a partner in the network has collaborated. The most central institution is not necessarily the institution with the highest number of co-authored publications.

From Table 1 for example we learn that the MNHN is the most central but has less co-authored papers (153) than the NHML (174). Between 2005-2008 the MNHN has co-authored with 22 EDIT institutions versus 19 for the NHML. We computed 2 dimensional network graph (Fig 1). Each node colour indicates a different level of "degree centrality"

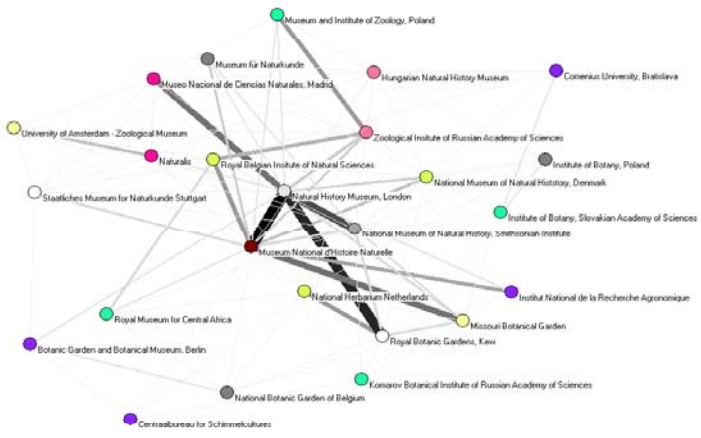

Figure 1. Degree centrality. Co-authorships in EDIT network for the years 2005-2008**.** All the nodes with the same number of connections to other nodes are all coloured the same (in network are 25 actors, 970 co-authorships, based on ISI-WoS data).

Table 1. EDIT institutions. Publications and EDIT co-authorships between 2005-2008 (based on ISI-WoS papers)

	Institution name	Total number of papers	Number of co-authorships in EDIT network	EDIT co-authored papers as % of total number	Number of pairs (e.g. MNHN published with 21 institutions)
1	Muséum National d'Histoire Naturelle (MNHN)	2071	153	7	21
2	Natural History Museum, London (NHML)	2202	174	8	18
3	National Museum of Natural History, Smithsonian Institute, Washington (UNSM)	1215	69	6	17
4	Zoological Museum, National Museum of Natural History, Denmark (UKBH-NHMD)	469	36	8	12
5	National Herbarium Netherlands (NHN)	256	35	14	12
6	Royal Belgian Institute of natural Sciences, Brussels (RBINS)	461	48	10	12
7	Hungarian Natural History Museum (HNHM)	235	17	7	11
8	Zoological Institute of Russian Academy of Sciences (ZINRAS)	474	56	12	11
9	Museo Nacional de Ciencias Naturales (CSIC-MNCN)	831	39	5	10
10	National Natural History Museum Naturalis (NHM)	237	28	12	10
11	Royal Botanic Gardens, Kew (RBGK)	581	70	12	9
12	Staatliches Museum for Naturkunde Stuttgart (SMNS)	104	18	17	9
13	University of Amsterdam- Zoological Museum Adam	200	19	10	8
14	Missouri Botanical Garden, (MO)	384	51	13	8
15	National Botanic Garden of Belgium (NBGB)	99	15	15	6
16	Institute of Botany, Poland (IBPAN)	148	11	7	6
17	Museum für Naturkunde (MfN)	296	24	8	6
18	Royal Museum for Central Africa, Tervuren (RMCA)	182	16	9	5
19	Museum and Institute of Zoology, Poland (MIZPAN)	162	28	17	5
20	Institute of Botany, Slovakian Academy of Sciences (IBSAS)	154	11	7	5
21	Komarov Botanical Institute of Russian Academy of Sciences (BINRAS)	146	7	5	5
22	Centraalbureau voor Schimmelcultures (CBS)	358	8	2	4
23	Botanic Garden and Botanical Museum, Berlin (FUBGBM)	64	10	16	4
24	Comenius University, Bratislava (CUB)	190	7	4	4
25	Institut National de la Recherche Agronomique (INRA)	261	20	8	4
26	Society for management of European biodiversity data (SMEB)	0	0	0	0
27	Species 2000	0	0	0	0
	TOTAL	11780	970		222

* Data of 25 institutions has been analyzed. Species 2000 and SMEBD did not have ISI- listed papers for 2005-2008, The papers of Real Jardin Botanico, part of the CSIC, were not considered in the sample. During the data collection phase the partner RBGE had not yet joined the consortium.

Co-authorship among researchers (work in progress)

Researchers in biodiversity science use the Web and web based tools such as Scratchpads to collaborate. We study the co-author relations of 11 individual researchers that are today members of the same online community. We looked at with who they have co-authored in the 10 year period before their membership. We are interested to know to what extent the co-author networks of the members overlap. The assumption is that membership that gives them access to a combination of overlapping and diverse knowledgeable people will positively affect the creation of new knowledge. Therefore we would like to know to what extent their co-author relations overlap or differ. Fig. 2 and 3 demonstrate the Scratchpad members and their co-author relations. We used UCINET6 and NetDraw for the graphs.

Fig. 2 shows the co-author relations between members and with their direct co-authors but not the relations from co-author-to-co-author. Fig 3 shows the ties between Scratchpad members, with their co-authors and ties among co-authors. In red the members, in blue their co-authors. The red circles in Fig. 2 highlight the co-authors that are shared by relations between 2 or more members. Co-author data was collected from the Web of Science and Google Scholar.

The question we ask oursleves at this stage is can we measure the similarlity of co-author networks among members with help of SNA?

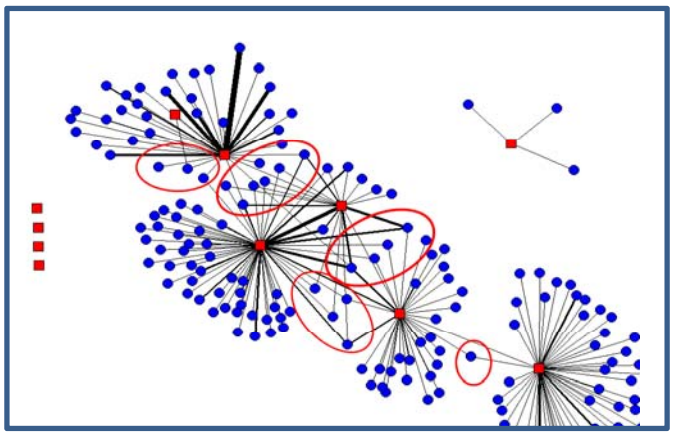

Figure 2. Scratchpad members and ties with co-authors. (2001-2010).

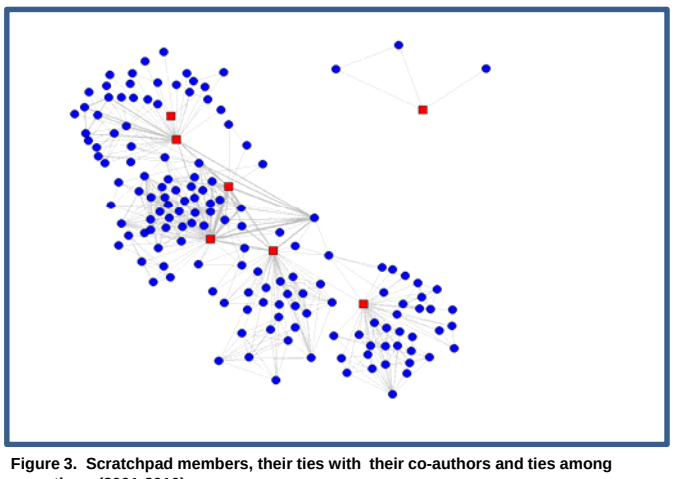

Figure 3. Scratchpad members, their ties with their co-authors and ties among co-authors (2001-2010).

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