

# Complexity of biotic interactions

– better expression of biodiversity importance?

THE FOLLOWING IS a short communication from MarBEF members on one of the key MarBEF issues – how to assess the role of biodiversity in ecosystem functioning – in which a novel approach is presented for potential future consideration in MarBEF Responsive Mode Proposals. This approach arose from a discussion on how to present biotic interactions in a quantitative way – and this was the outcome.

By **Monika Kędra** Jan Marcin Węslawski



Baltic Sea site. North Sea site.

The common way of assessing the importance of biodiversity for the functioning of the ecosystem is to focus on functional groups (Raffaelli *et al.* 2001, Bolam *et al.* 2002). In the Baltic area, Bonsdorff & Blomqvist (1993) and Bonsdorff & Pearson (1999) presented exhaustive summaries of species functions, advocating the functional approach in biodiversity assessment, but did not answer how to quantitatively measure the biotic interactions necessary to address functionality.

We propose a new approach that allows the importance of biodiversity (number of species) for the functioning of the ecosystem (assemblage) to be assessed. Our approach is based on the assumption that biodiversity is more significant for ecosystem functioning in the case of species that are biologically linked than in the case where species are not interconnected. This small exercise is based on the examination of links among species in a very simple ecosystem – the shallow, sandy, barren bottom of the North and Baltic Seas. Data comes from the COSA VI FP (Coastal

Sands as biocatalytical filters; [www.eu-cosa.net](http://www.eu-cosa.net)). At both sites, the species diversity was low in single samples (on average five species at the Baltic site and seven at the North Sea site; Węslawski *et al.* in prep). Each species was assessed for the number of relations with other species in the examined sample and each relation was considered to have a different value (no relation – 0, commensalisms – 1, competition for space – 2, predator-prey – 3, intra-species relations – 4). Cluster analysis was used to present the results. **Species that were interconnected through relationships are shown on the diagram close to each other, while species with fewer relationships are further apart.** Moreover, the ratio (*r*) between the number of observed relations with other species and the number of total possible relations was calculated (intra-species relations were not included). We selected the samples with equal species numbers. The cluster diagram (Fig 1) shows closer biological relations in the North Sea samples (two groups of species, close to each other,  $r = 9/10$ ) compared to the Baltic Sea samples (four, loose groups of species,  $r = 2/10$ ). This may lead to the conclusion that the Baltic site is physically controlled while the North Sea site is more biologically developed, with more links among species. These results concur with Elmgren (1984) and Elmgren & Hill (1997); the difference between the species-rich North Sea and the species-poor Baltic starts in the northern Baltic, where the whole functional-group biofiltrators are absent from the macrofauna.

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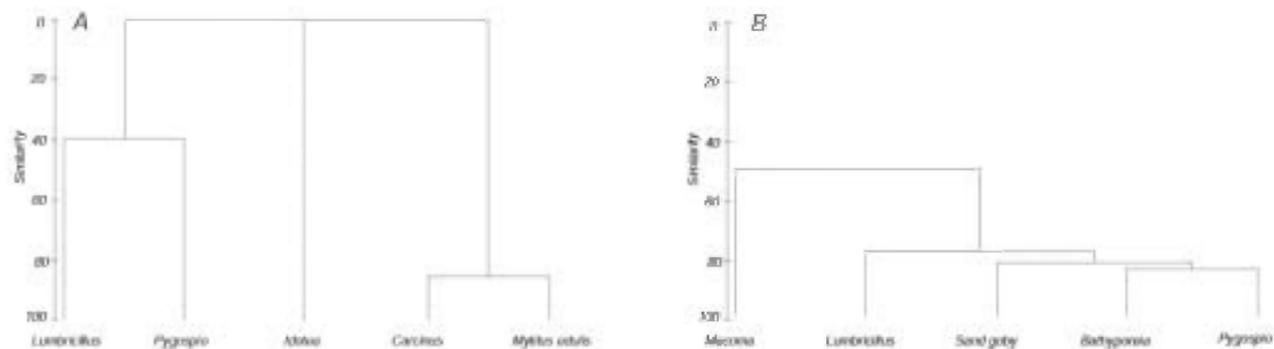
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**Fig 1.** Cluster diagram showing closer biological relations in the North Sea samples as compared to Baltic samples.

# MarBEF Gender Action Plan

– why 40% and not 50%?

By **Simonetta Frascchetti**

IN THE LAST issue of the MarBEF newsletter, I read with great interest the article by Olive Heffernan on “Women and Science.” I admit that my first impression was “The gender issue again?” because I thought that sexual discrimination was not a real problem in the university system of European countries. Then, the article made me realise that the gender issue is still a source of hot debate.

The dean of Harvard University, for instance, a few months ago proposed three hypotheses to explain the different performances of women and men in US universities: (1) Women are not genetically endowed for scientific research (with the exception of biology: MarBEF women are safe!); (2) family affairs prevent them from working 80 hours per week, the time a person must invest to reach tenure in prestigious universities; and (3) women’s ambitions are not the same as men’s. Needless to say, the dean ended up in trouble. I hope not to be misunderstood for what I’m going to say. I agree that the first hypothesis of Summers (the dean of Harvard), postulating that mathematics and physics are not for women, is not supported by statistical evidence. The other two proposed explanations, pertaining to reproductive responsibilities and competitive attitudes, however, could be partially true, in spite of numerous exceptions.

Beside Summers’ debatable position, I think that, in our field, Sandra Knapp’s (2005) sentence, answering a questionnaire on women in science, reflects also my own experience: “Being a woman has had little negative impact on my life as a scientist, but being a scientist has had a seriously detrimental effect on my life as a woman.” As for my department, for example, my impression is that there is no discrimination against women: sound arguments are accepted, whatever the sex of the speaker, and weak arguments are criticised in the same way. However, women prevail over men in basal positions in the university hierarchy (lecturers), men slightly prevail as associated professors, women are a scant minority as full professors. Why? My opinion is that one of the reasons there are fewer women in top positions is because their choices are more varied than those of men. Men just want to go on with their career, while women in some cases want the career, in some cases want to have a family

and a career, in some others they simply want to take care of their children. I do not want to discuss the enormous difficulties of managing both family and career: ways to solve this issue, and the need for a greater involvement from men, are out of discussion and over the scope of this article (and partially explain points 2 and 3 of Summers’ intervention).

Damshen *et al* (2005) are right when stressing that talking about the gender balance (even in textbooks) might lead women to “imitate” other women who gave relevant contributions to science. However, their request to give both name and surname of authors within textbooks, so to make more explicit the contribution of women to research, seems ridiculous to me. And, I’m sorry, my feeling is exactly the same when I see that a scientific project carries more “weight” if a strong female component (regardless of its effective value) has been included, or, even, the “necessity” of having 40% of women in European projects to have more chances of funding.

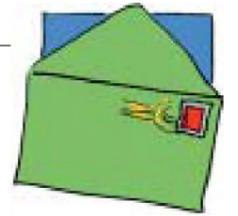
I do not know of any woman who would like to foster her career, or to be included in a project, just because of the fact that she was a woman. We deserve equal opportunities to reach excellence and to be ambitious (if we want it), so that this will not be just a male privilege, as suggested by Summers. We do not have to fight to reach a percentage of female involvement just because we are females. Being a woman in a network of excellence leads one to ask: am I here because I am excellent, or because the 40% ratio has to be reached? And then, considering the sex ratio in our species, why 40% and not 50%?

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## Letters to the Editor

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PLEASE NOTE: please provide your name and email address. Submitted letters may be edited or cut.

Photos: J-M Węslawski



Scenes from a scientific picnic in Gdynia, held by MarBEF participants at the Polish Academy of Sciences, Gdansk. This public outreach event on May 22, 2005, saw over 3,000 visitors at exhibits on biodiversity.

## Errata, Issue 2

**Page 2:** *Smittina corallium*. No, not a new species, just an error! Should read *Smittina*, *Corallium*, representing *Smittina* sp. and *Corallium rubrum*.

**Page 20:** Mr Tony Rees – should read Dr Tony Rees.

**Page 22:** The link to EurOBIS is [www.marbef.org/data/eurobis.php](http://www.marbef.org/data/eurobis.php).