

## Press release

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### Basic information

Name: Pia Viuf Ørby      Email: [piv@ph.au.dk](mailto:piv@ph.au.dk)      Phone: +45 8715 8595

Department of: Public Health

Main supervisor: Vivi Schlünssen

Title of dissertation: "Cross-disciplinary studies on pollen in health and environmental sciences"

Date for defence: 13-12-2017 at (time of day): 14 Place: Merete Barker Auditoriet

Press release (Danish)

Tværdisciplinære studier af pollen indenfor sundheds- og miljøforskning.

Pollen spiller en afgørende rolle i naturen, men forårsager også allergiske reaktioner hos op mod 20% af befolkningen. Dette tværdisciplinære PhD projekt indenfor folkesundhed og miljøvidenskab strækker sig over flere områder indenfor pollenforskning, og fokuserer på de to primære allergifremkaldende pollen i Nordeuropa; græs og birk.

Resultaterne viser bl.a. lokale forskelle i græspollenkoncentrationer i byområder, hvilket kan skyldes, at græsserne frigives i lav højde, og findes i lokale "hot-spots".

Der blev også set store udsving i døgnvariationen af græspollen i både Århus, København, og i Cordóba (Spanien). Dette kan være resultatet af, at pollen kommer fra mange forskellige græsarter, som ikke blomstrer samtidigt, men også forskellige faktorer ift. vejret, og netop den ujævne fordeling af kilderne i byområder, kan spille ind.

Reaktionen på pollenallergener kan øges efter gentagende eksponeringer, hvilket kaldes "priming". Hvorvidt denne effekt har stor betydning for allergikernes lungefunktion, blev undersøgt gennem forsøg med allergikere udenfor og i slutningen af pollensæsonen, efter flere ugers naturlig eksponering. Selvom denne effekt er beskrevet tidligere, ses den ikke i resultaterne fra dette studie. Samtidig eksponering for pollen og luftforurening kan også øge reaktionen på pollen. I dette studie er den potentielle risiko for forøget reaktion undersøgt ved, at se på niveauer og variation i koncentrationen af pollen og luftforurening i København. Ozon og pollen koncentrationer viste enslydende variationer. For yderligere at undersøge dette område, er der udført forsøg med allergikere, eksponeret for allergener i kombination med ozon, hvor ingen øget effekt på lungefunktionen blev set.

De opnåede forskningsresultater bidrager til forståelsen af nogle af de mange udfordringer der stadig er indenfor feltet af pollenforskning.

Ph.d.-studiet er gennemført ved Institut for Folkesundhed, Health, og Institut for Miljøvidenskab, Science and Technology, Aarhus Universitet.

Projektet er gennemført af Pia Viuf Ørby, der forsvare det d. 13/12

Forsvaret af ph.d.-projektet er offentligt og finder sted den 13/12 kl. 14 i Merete Barker auditorium, Aarhus Universitet, Bartholins Alle 3, Aarhus. Titlen på projektet er "Cross-disciplinary studies on pollen in health and environmental sciences". Yderligere oplysninger: Ph.d.-studerende Pia Ørby, e-mail: [piv@ph.au.dk](mailto:piv@ph.au.dk), tel.: +45 8715 8595

Bedømmelsesudvalg: Associate Professor Søren Kjærgaard (Formand for bedømmelsesudvalget), Institut for Folkesundhed, Aarhus Universitet.

Forsker Åslög Dahl, Institutionen för biologi och miljövetenskap, Göteborg Universitet.

Senior Forsker Hille Suojalehto, Finnish Institute for Occupational Health (FIOH), Helsinki.

Press release (English)

## Cross-disciplinary studies on pollen in health and environmental sciences

Pollen has a crucial and important role to play in nature, but it is also the cause of allergic reaction in as much as 20 % of the population.

This cross-disciplinary project in Public Health and Environmental Science covers some of the many areas within pollen research, focus being on two of the main allergens in northern Europe; grass and birch.

The results illustrate intra-urban differences in grass pollen concentrations, attributable to e.g. the low release height and local “hot-spots” of grass pollen sources.

Also great variation in the diurnal pattern were seen in both Aarhus, Copenhagen and Cordóba, Spain. This could be due to differences in time of flowering in the many grass species, due to impact from weather, and the uneven distribution of the grass areas.

The response to allergens can increase following repeated exposures. This is known as “priming”. In this study, it was examined whether this effects has a large impact on the lung function in participants with pollen allergy, by comparing exposure studies outside and in the end of the pollen season.

Although this effect has previously been demonstrated, it was not apparent in these studies.

Co-exposure to pollen and air pollution can also increase the response to allergens. In this study the potential risk of effects from this co-exposure was examined by analyzing the levels and variation in pollen and air pollutants in Copenhagen, and co-variation was found for pollen and ozone. To further examine this co-exposure, studies were performed exposing participants with allergy to allergens and ozone simultaneously. No increased effect on the lung function was seen.

The presented results contribute to the understanding of some of the many challenges that still remain in the field of pollen research.

The Ph.d. study is performed at Department of Public Health, Faculty of Health, and Department of Environmental Science, Faculty of Science and Technology, Aarhus University.

The project was carried out by Pia Viuf Ørby, who is defending her dissertation on 13/12.

The defence is public and takes place on 13/12 at 14 in Merete Barker Auditorium, Aarhus University, Bartholins alle 3, Aarhus. The title of the project is "Cross-disciplinary studies on pollen in health and environmental sciences". For more information, please contact PhD student Pia Ørby, email: piv@ph.au.dk, Phone +45 8715 8595.

Assessment Committee: Associate Professor Søren Kjærgaard (chairman and moderator of the defense), Department of Public Health, Aarhus University.

Researcher Åslög Dahl, Institutionen för biologi och miljövetenskap, Göteborg Universitet.

Senior Researcher Hille Suojalehto, National Institute for Occupational Health (FIOH), Helsinki.

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