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Department of Biotechnology, Higher Institute of Biotechnology  
University of Monastir, Tunisia



Joint PhD VUB & UM  
2017-2018

INVITATION to the Public defence of

**Assia HAMDI**

To obtain the academic degree of

**'DOCTOR IN PHARMACEUTICAL SCIENCES'**  
**'DOCTOR IN BIOLOGICAL SCIENCES AND BIOTECHNOLOGY'**

**Biological and chemical investigations of *Haplophyllum tuberculatum* (Forssk.) A. Juss. growing in Tunisia.**

**Friday 29 June 2018**

Auditorium **Piet Brouwer**, 17:30  
Faculty of Medicine and Pharmacy, Laarbeeklaan 103, 1090 Brussel

How to reach the campus Jette:

<http://www.vub.ac.be/english/infoabout/campuses>

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## Summary of the dissertation

The objectives of the thesis are biological and chemical investigations of *Haplophyllum tuberculatum* (Forssk.) A. Juss. Essential oils (EO), organic and aqueous extracts were prepared. The phytochemical properties, the polyphenolic content, the antioxidant and antimicrobial activities of *Haplophyllum tuberculatum* samples were evaluated. The phytotoxic, anti-leishmanial and cytotoxicity activities of the EO were determined. The anti-inflammatory, gastroprotective and analgesic effects of the organic extracts from leaves were explored. The phytochemical screening indicated that *H. tuberculatum* parts are rich in secondary metabolites as polyphenols, alkaloids and terpenoids. Antioxidant assays revealed that the radical inhibitions depend on the extract and the studied part. EO showed moderate anti-radical activity. The anti-microbial effects showed that *Bacillus licheniformis* and *Candida krusei* were sensible bacteria and yeast for various extracts. The phytotoxic activities demonstrated that the EO had high toxicity against the tested seeds. EO showed moderate anti-leishmanial effects and potent cytotoxicity. The ethyl acetate and butanolic extracts exhibited anti-inflammatory, gastroprotective and analgesic effects. The petroleum ether extract revealed strong anti-inflammatory and analgesic activities. The bio-guided chromatographic studies, of ethyl acetate extract using UPLC-MS, showed the presence of 33 compounds of which arabelline, majidine, dictamnine and qudsine are found for the first time in the species *H. tuberculatum*. The GC-MS analysis of the petroleum ether extract fatty-acid profile showed that  $\gamma$ -linolenic was the major compound. To confirm the pharmacological activities of the various extracts, the bioactive compounds should be isolated and individually retested.

## Curriculum Vitae

Assia HAMDI was born 11/05/1982 in Medenine Tunisia. She obtained a Baccalaureate in Experimental Sciences in 2003 at the Ibn Sina School in Medenine; the diploma of academic studies of the first cycle in 2005 and of the second cycle in 2007 in "Life and Earth Sciences" at the Faculty of Sciences, Gabes; a Master degree in 2011 in "Aquaculture and Marine Biotechnology" at the Higher Institute of Biotechnology of Monastir (ISBM), with a research subject "Biological and chemical valorization of the chloroformic extract of the halophyte species *Salicornia arabica* L. growing in Tunisia; Formulations and preparations of a salt and a canned food from the same plant".

Her PhD studies began in December 2012 at the ISBM, Laboratory of Chemical, Galenic and Pharmacological Development of Drugs, Faculty of Pharmacy Monastir, under the supervision of Prof. Zohra MARZOUK. In 2013 a joint PhD with the Department of Analytical Chemistry, Applied Chemometrics and Molecular Modelling, Vrije Universiteit Brussel, Belgium, was started under the supervision of Prof. Yvan VANDER HEYDEN. Her studies focused on "Biological and chemical investigations of *Haplophyllum tuberculatum* (Forssk.) A. Juss. growing in Tunisia". In this PhD project, she published 6 papers as first author in peer reviewed international journals. Other papers are in preparations. She participated, with poster and oral presentations in congresses, scientific days, seminars and workshops. She is also a coauthor in published papers and congress presentations. In 2017 and 2018, she gave temporary courses (practical work) in plant biology to the second class of pharmacy at the Faculty of Pharmacy of Monastir. She was a co-promoter of 2 master thesis, 2 End-of-Study projects, and 2 student trainings in the Biotechnology Engineering 3rd year.