



HAL
open science

Characterization of anthelmintic properties of the lupine seed, *Lupinus* spp

O. Dubois, Guillaume Salle, H el ene F evrier, Jean-Bernard Magnin-Robert, Nicole Harzic, Claude Charvet, C edric Neveu, C ecile Enguehard-Gueiffier, Leslie Boudesocque-Delaye

► To cite this version:

O. Dubois, Guillaume Salle, H el ene F evrier, Jean-Bernard Magnin-Robert, Nicole Harzic, et al.. Characterization of anthelmintic properties of the lupine seed, *Lupinus* spp. 9. Joint Natural Products Conference 2016, Jul 2016, Copenhagen, Denmark. Thieme, *Planta Medica*, 82, 2016, *Planta Medica*. 10.1055/s-0036-1596990 . hal-01602859

HAL Id: hal-01602859

<https://hal.science/hal-01602859>

Submitted on 3 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destin ee au d ep ot et  a la diffusion de documents scientifiques de niveau recherche, publi es ou non,  emanant des  tablissements d'enseignement et de recherche fran ais ou  trangers, des laboratoires publics ou priv es.



Distributed under a Creative Commons Attribution - ShareAlike 4.0 International License

Characterization of anthelmintic properties of the lupine seed, *Lupinus spp.*

O. Dubois^{1,2}, Guillaume Sallé^{1,2}, Hélène Février^{1,2}, Jean-Baptiste Magnin-Robert³, Nicole Harzic⁴, Claude Charvet^{1,2}, Cédric Neveu^{1,2}, Cécile Enguehard-Gueiffier⁵, Leslie Boudesocque-Delave^{1,2}

¹INRA UMR1282 Infectiologie et Santé Publique, F-37380 Nouzilly, France, ²Université François Rabelais UMR1282 Infectiologie et Santé Publique, F-37000 Tours, France, ³INRA, UMR 1347 Agroécologie, Pôle GEAPSI, BP 86510, 21000 Dijon, France, ⁴Jouffray-Drillaud, La Litière, F-86600 ST Sauvant, France, ⁵INSERM UMR1069 Nutrition, Croissance et Cancer, Faculté de Médecine, 10 boulevard Tonnelé 37032 Tours Cedex, France

Digestive strongyles are a serious handicap for sheep farming, due to production losses or associated veterinary costs. Meanwhile, the molecules currently available to control these parasites are no longer appropriate due to the emergence of resistant parasite populations but also because of the environmental impact of these molecules. The use of nutraceuticals, plants simultaneously presenting nutritional and medicinal qualities, could be an alternative solution to sustainable pest management. Lupine seed, *Lupinus spp.*, is a protein crop used in animal farming. This plant also contains alkaloids that target nicotinic receptors [1], targets for anthelmintic drugs. These alkaloids provide toxic properties to the bitter ecotypes. The varieties used in animal feed legally contain less than 1.5% bitter seeds. Our study aims at validating and quantifying these properties through in vitro testing of seed extracts from alkaloid-rich or -poor varieties. Five varieties of sweet lupine (3 *L. albus*, 1 *L. angustifolius*, 1 *L. luteus*) and six bitter ecotypes (3 *L. albus*, 1 *L. angustifolius*, 1 *L. luteus*, 1 *L. mutabilis*), richer in alkaloids, were tested against *H. contortus*. Two *L. albus* varieties, a sweet-one ENERGY and a bitter-one E063, exhibited the higher activity on *H. contortus* mobility. Chemical analyses revealed a higher alkaloid content in the alkaloid-rich (E063) (3.3% vs 0.04% in the alkaloid-poor) but a lower diversity than in the alkaloid-poor variety (ENERGY) (n=3 vs 5 respectively). Aqueous extracts of both varieties could significantly control infective larval stages and inhibited egg development. Extracted alkaloid fractions exhibited a stronger inhibitory effect, corroborating the working hypothesis, and could also control a multi-resistant isolate. These results are in favor of nutraceutical properties of lupine seed. Alkaloids of ENERGY variety exhibited original mechanism of action against cholinergic receptors, with low EC₅₀.

Acknowledgements: the authors thank the Région Centre Val de Loire for financial support (Projet LUPINEMA)

Keywords: lupine seed, alkaloid, anthelmintic

References:

- [1] Green BT, Welch KD, Panter KE, Lee ST. Plant toxins that affect nicotinic acetylcholine receptors: A review. *Chem Res Toxicol* 2013; 26: 1129–1138

PRESENTATION OF POSTERS

Numbered poster boards for posters size A0 (portrait, 84.1 x 118.9 cm or 33.1 x 44.8 inches) and pins are available. Posters are ordered according to the topics of JNPC2016, and you should find your poster number in the electronic poster abstract book.

Poster sessions

Posters should be presented by the corresponding author during poster sessions Monday-Wednesday 13.00-14.45 according to the below schedule. Posters not presented by the authors will not be published in the final abstract book in *Planta Medica*.

Monday	Poster 1-365
Tuesday	Poster 366-739
Wednesday	Poster 750-1115 and YRW posters 1-11

Themes

Posters are sorted according to themes as shown below.

Theme 1: Advances in natural products research spurred by new technological developments

Theme 1.1:	Poster 1-20	Theme 1.3:	Poster 64-80
Theme 1.2:	Poster 21-63	Theme 1.4:	Poster 81-133

Theme 2: Sources of bioactive compounds

Theme 2.1:	Poster 134-544	Theme 2.4:	Poster 660-694
Theme 2.2:	Poster 545-610	Theme 2.5:	Poster 695-739
Theme 2.3:	Poster 611-659		

Theme 3: Sustainable sources of bioactive natural products

Theme 3.1:	Poster 750-781	Theme 3.3:	Poster 788-797
Theme 3.2:	Poster 782-787		

Theme 4: Natural products as preventive and curative medicine for humans and animals

Theme 4.1:	Poster 798-840	Theme 4.3:	Poster 931-991
Theme 4.2:	Poster 841-930	Theme 4.4:	Poster 992-1016

Theme 5: Production and regulatory aspects of herbal preparations

Theme 5.1:	Poster 1017-1043	Theme 5.3:	Poster 1086-1091
Theme 5.2:	Poster 1044-1085		

Late-added abstracts from various themes

Poster 1092-1115



Abstract book

- Plenary lectures
- Keynote lectures
- Short lectures
- Young Researchers Workshop Posters
- Pre-conference Symposium
- Poster session Monday
- Poster session Tuesday
- Poster session Wednesday

