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Project

Essential oils with acaricidal properties are considered as alternative acaricides to control mites. Furthermore, my PhD project focused on the two spotted spider mite *Tetranychus urticae* (Koch). In fact this mite is one of the most important pests of fruit, vegetable and ornamental plants worldwide. The spider mites have developed a resistance to more than 80 acaricides in more than 60 countries. For that reason, extracts of plants (including essential oils) are very interesting and realistic alternatives to synthetic acaricides because of their selectivity, biodegradability and few side effects on non-target organisms and the environment. Our work tests the efficiency of some plant on *T. urticae* in laboratory and in field. The mortality and fecundity were measured with different essential oil extract concentrations. Artificial blends of constituents of oils were also prepared and tested with individual constituents missing from the mixture. We analyse the persistence of acaricidal activity of different extracts and their resistance towards *Tetranychus urticae*.

I. Papers in international journal (Published or in press):

- 1- Attia S, Grissa KL, Mailleux AC, Lognay G, Heuskin S, Mayoufi S and Hance T, Effective concentrations of garlic distillate (*Allium sativum*) for the control of *Tetranychus urticae* (Tetranychidae). *Journal of Applied Entomology* DOI: 10.1111/j.1439-0418.2011.01640.x 2011 (2011).
2. Attia S, Grissa KL, Lognay G, Heuskin S, Mailleux AC and Hance T, Chemical composition and Acaricidal Properties of *Deverra scoparia* Essential Oil (Araliales : Apioaceae) and Blends of Its Major Constituents Against *Tetranychus urticae* (Acari : Tetranychidae). *Journal of Economic Entomology* **104** :1220-1228 (2011).
3. Attia S, Grissa KL, Lognay G, Heuskin S, Mailleux AC and Hance T, Acaricidal activities of *Santolina africana* and *Hertia cheirifolia* essential oils against the two spotted spider mite (*Tetranychus urticae*). *Pest Management Science* (in press) (2011).
4. Attia S, Grissa KL, Ghrabi G, Zeineb, Mailleux AC, Lognay G, and Hance T, Acaricidal activity of 31 essential oils extracted from plants collected in Tunisia. *Journal of essential oil research* (in press) (2011).

II. Other publications:

5. S. Attia, K.L. Grissa, Z. Ghrabi-Gammar, G. Lognay and Thierry Hance, Assessment of the acaricidal activity of several plant extracts on the phytophagous mite *Tetranychus urticae*, in Tunisian citrus orchards. *Bulletin SRBE/KBVE* 174: 71-79 (2011).
6. S. Attia, K.L. Grissa, Z. Ghrabi-Gammar, G. Lognay and Thierry Hance, Lutte biologique contre *Tetranychus urticae* par les extraits naturels de plantes en vergers d'agrumes. *Faunistic Entomology*, 63 (4) : 229-235 (2011).
7. S. Attia, Z. Ghrabi-Gammar, S. Barrek, T. skanji barrek and K.L. Grissa, Contrôle des insectes et des acariens phytophages par les extraits végétaux. Actes des 14 èmes journées scientifiques sur les résultats de la recherche agricole. IRESA Hammamet 6 et 7 décembre : 832-847 (2007).

III. Communications (Congress, Symposiums)

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1. Attia S., Grissa K.L., Mailleux A.C., Lognay G., and Hance T., (2011). The persistence of the toxicity and the emergence of resistance of 4 natural biocids controlling *Tetranychus urticae* (tetranychidae). Société royale belge d'entomologie (SRBE). One day of entomology in Belgium. 4th December 2011.
2. Attia S., Grissa K.L., Mailleux A.C., Lognay G., and Hance T., (2010) Comparative toxicities of *Deverra scoparia* essential oil and blends of its major constituents against *Tetranychus urticae* (Acari: Tetranychidae). Gembloux, Journée de la Chimie verte 2010.
3. Attia S., Grissa K.L., Mailleux A.C., Lognay G., and Hance T., (2010) Comparative toxicities of *Santolina africana* and *Hertia cheirifolia* (Asteraceae) essential oil against *Tetranychus urticae* (Acari: Tetranychidae). 17th Benelux Congress of Zoology.
4. Attia S., Grissa K. L. Ghrabi Z., Mailleux A.C., Lognay G. and Hance T. (2010) Comparative toxicities of a wild Plant essential oil and blends of its major constituents on mortality and fecundity of spider mites (Acari: Tetranychidae). International Symposium on Essential oils. Wroclaw, Poland. September 5-8, 2010. <http://www.iseo2010.wsf.wroc.pl>
5. Attia S., K. L. Grissa, Mailleux A-C, G. Lognay, and Th. Hance (2010) Controle de *Tetranychus urticae* par des extraits naturels de plantes. VII CIFE. 5-10 July 2010. Louvain-la-Neuve, Belgium.
6. Attia S., K. L. Grissa, Ghrabi Zeineb, G. Lognay, Mailleux A-C, and Th. Hance (2010) Acaricidal Bioactivities of *Pteranthus dichotomus* Forsk. and *Allium sativum* (L.) extracts against *Tetranychus urticae* (Acari: Tetranychidae). Antibe. 37ième journée des entomophagistes, 5-7 may 2010, Antibe. France
7. Attia S., K. L. Grissa, Ghrabi Zeineb, G. Lognay, Mailleux A-C, and Th. Hance (2010) Acaricidal Bioactivities of *Pteranthus dichotomus* Forsk. essential oil against *Tetranychus urticae* (Acari: Tetranychidae). Gembloux. Symposium on chemical Entomology, 5th May. Belgium.
8. Attia S., K. L. Grissa, Mailleux A-C, G. Lognay, and Th. Hance (2010). « Acaricidal activity of two plants endemics to North Africa against the two spotted spider mite *Tetranychus urticae* (Tetranychidae)" 4 Nov, Leuven
9. Attia S., K. L. Grissa, Mailleux A-C, G. Lognay, and Th. Hance (2010). Assessment of the acaricidal activity of several plant extracts on the phytophagous mite *Tetranychus urticae*, in Tunisian citrus orchards. 6th December SRBE- Entomology in Belgium 2010.
10. Attia S., Z. G. Ghrabi, S. Barrek, K. L. Grissa (2006). Effects of *Cleome arabica* on pests. International symposium of Perfume, Aromatic and Medicinal Plants : From production to Valorisation SIPAM 2006 » INRA Medenine, Tunisia, November (2006)

publications

1. Attia, Sabrine; Lognay, Georges; Heuskin, Stéphanie; Hance, Thierry. *Insecticidal activity of Lavandula angustifolia Mill against the pea aphid Acyrthosiphon pisum*. In: *Journal of Entomology and Zoology Studies*, Vol. 4, no.1, p. 118-122 (2016). <http://hdl.handle.net/2078.1/172727>
2. Attia, Sabrine; Lebdi, Grissa Kaouthar; Heuskin, Stéphanie; Lognay, Georges; Hance, Thierry. *An analysis of potential resistance of the phytophagous mite, Tetranychus urticae Koch (Acari: Tetranychidae) to four botanical pesticides*. In: *Biotechnologie, Agronomie, Société et Environnement*, Vol. 19, no.3, p. 232-238 (2015). <http://hdl.handle.net/2078.1/165141>
3. Attia, Sabrine; Grissa-Lebdi, Kaouthar; Almohamad, Raki; Hance, Thierry; Mailleux, Anne-Catherine. *Persistence of toxicity in four natural extracts controlling Tetranychus urticae as affected by Tween®20 supply*. In: *Tunisian Journal of Plant Protection*, Vol. 10, no. 1, p. 35-44 (2015). <http://hdl.handle.net/2078.1/165331>
4. Attia, Sabrine; Lebdi, Kaouthar Grissa,; Heuskin, Stéphanie; Lognay, Georges; Mailleux, Anne-Catherine; Hance, Thierry. *How to get rid of the two spotted spider mites ?*. In: *Revue des Régions Arides*, Vol. 35, no.3, p. 1739-1748 (2014). <http://hdl.handle.net/2078.1/156035>
5. Attia, Sabrine; Grissa, Kaouthar; Lognay, Georges; Bitume, Ellyn; Hance, Thierry; Mailleux, Anne-Catherine. *A review of the major biological approaches to control the worldwide pest Tetranychus urticae (Acari: Tetranychidae) with special reference to natural pesticides*. In: *Journal of Pest Science*, (2013). doi:10.1007/s10340-013-0503-0 (Accepté/Sous presse). <http://hdl.handle.net/2078.1/132169>
6. Attia, Sabrine; Grissa, Kaouthar L.; Ghrabi, Zeineb G.; Mailleux, Anne-Catherine; Lognay, Georges; Hance, Thierry. *Acaricidal activity of 31 essential oils extracted from plants collected in Tunisia*. In: *Journal of Essential Oil Research*, Vol. 24, no. 3, p. 279-288 (2012). doi:10.1080/10412905.2012.676777. <http://hdl.handle.net/2078.1/161428>
7. Attia, Sabrine; Grissa, Kaouthar L.; Mailleux, Anne-Catherine; Heuskin, Stéphanie; Lognay, Georges; Hance, Thierry. *Acaricidal activities of Santolina africana and Hertia cheirifolia essential oils against the two-spotted spider mite (Tetranychus urticae)*. In: *Pest Management Science*, Vol. 68, no. 7, p. 1069-1076 (2012). doi:10.1002/ps.3269. <http://hdl.handle.net/2078.1/161409>
8. Attia, Sabrine; Grissa, Kaouthar Lebdi; Mailleux, Anne-Catherine; Lognay, Georges; Heuskin, Stéphanie; Mayoufi, Saïd; Hance, Thierry. *Effective concentrations of garlic distillate (*Allium sativum*) for the control of *Tetranychus urticae* (Tetranychidae)*. In: *Journal of Applied Entomology*, Vol. 136, no. 4, p. 302-312 (2012). doi:10.1111/j.1439-0418.2011.01640.x. <http://hdl.handle.net/2078.1/75507>
9. Attia, Sabrine; Grissa, Kaouthar Lebdi; Zeineb, Ghrabi-Gammar; Mailleux, Anne-Catherine; Lognay, Georges; Hance, Thierry. *Assessment of the acaricidal activity of several plant extracts on the phytophagous mite *Tetranychus urticae* (Tetranychidae) in Tunisian citrus orchards*. In: *Bulletin de la Société Royale Belge d'Entomologie*, Vol. 147, p. 71-79 (2011). <http://hdl.handle.net/2078.1/75505>
10. Attia, Sabrine; Grissa, Kaouthar Lebdi; Lognay, Georges; Heuskin, Stéphanie; Mailleux, Anne-Catherine; Hance, Thierry. *Chemical composition and acaricidal properties of *deverra scoparia* essential oil (Araliales: Apiaceae) and blends of its major Constituents against *tetranychus urticae* (Acari: Tetranychidae)*. In: *Journal of Economic Entomology*, Vol. 104, no. 4, p. 1220-1228 (2011). doi:10.1603/EC10318. <http://hdl.handle.net/2078.1/88682>