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副教授

讲师



马恩波，女，1953年生，山西交城人。山西大学应用生物学研究所教授，博士生导师。1991年毕业于陕西师范大学获理学博士学位。2007年至2019年担任山西大学应用生物学研究所所长，为山西省昆虫学会副理事长，多次赴美留学和学术访问。自1991年担任研究生导师以来，已培养出数十名博硕士研究生。在科研方面，多年来从事动物生化与分子生物学等研究工作，曾先后主持国家自然科学基金项目9项，省级科研项目30余项，在国内外有关学术刊物发表研究论文260余篇。被多次评为校级教书育人先进个人，曾于1994年获全国“三育人先进个人”荣誉称号，2004年获“山西省十大女杰”和“三八红旗手”荣誉称号，2007年被评选为省委联系的高级专家，2012年被评选为山西省师德标兵。

#### 科研项目

1. 飞蝗细胞色素P450单氧化酶基因代谢解毒、生理功能及分子调控，国家自然科学基金重大国际合作项目（2014-2018），275万元，项目编号：31320103921
2. 飞蝗细胞色素P450基因鉴定及基于RNAi的农药代谢特性研究，国家自然科学基金项目（2012-2015），66万元，项目编号：31172161
3. 飞蝗抗药性及生长调节剂的筛选和应用技术，公益性行业（农业）专项（2008-2013），30万元，项目编号：200903021

4. 基于RNAi的飞蝗细胞色素P450杀虫剂代谢特性研究，教育部博导类课题（2012-2014），12万元，项目编号：20111401110006

5. 东亚飞蝗杀虫剂解毒酶系的分子特性及其在抗药性中的作用，国家自然科学基金重大国际合作项目（2009-2012），120万元，项目编号：30810103907

#### 科技奖励

1. “重要经济昆虫分子进化与分子毒理学研究” 2010年获得山西省自然科学三等奖
2. “杀虫剂和农业污染物对蝗虫的生态毒理学研究” 2007年获得山西省自然科学二等奖
3. “蝗虫系统进化与遗传学研究” 2004年获得山西省自然科学二等奖

#### 代表性论文

1. Liu, J., Zhang, X., Wu, H., Gao, Y., Silver, K., **Ma, E.**, ... & Zhu, K. Y., Comparisons of microsomal cytochrome P450 content and enzymatic activity towards selected model substrates and insecticides in different tissues from the migratory locust (*Locusta migratoria*), *Chemosphere*, 2018. 366-373.
2. Zhang, X., Kang, X., Wu, H., Silver, K., Zhang, J., **Ma, E.**, & Zhu, K. Y., Transcriptome-wide survey, gene expression profiling and exogenous chemical-induced transcriptional responses of cytochrome P450 superfamily genes in migratory locust (*Locusta migratoria*), *Insect Biochemistry and Molecular Biology*, 2018.
3. Zhao, X., Qin, Z., Liu, W., Liu, X., Moussian, B., **Ma, E.**, ... & Zhang, J. Nuclear receptor HR3 controls locust molt by regulating chitin synthesis and degradation genes of *Locusta migratoria*, *Insect biochemistry and molecular biology*, 2018.92.1-11.
4. Yu, Z., Wang, Y., Zhao, X., Liu, X., **Ma, E.**, Moussian, B., & Zhang, J. The ABC transporter ABCH-9C is needed for cuticle barrier construction in *Locusta migratoria*. *Insect biochemistry and molecular biology*, 2017. 87, 90-99.

5. Zhang, X., Wang, J., Liu, J., Li, Y., Liu, X., Wu, H., **Ma, E.**, ... & Zhang, J. Knockdown of NADPH-cytochrome P450 reductase increases the susceptibility to carbaryl in the migratory locust, *Locusta migratoria*. *Chemosphere*, 2017. 188, 517-524.
6. Wu, H., Zhang, Y., Shi, X., Zhang, J., & **Ma, E.** Overexpression of Mn-superoxide dismutase in *Oxya chinensis* mediates increased malathion tolerance. *Chemosphere*, 2017.181, 352-359.
7. Han, Y., Song, S., Wu, H., Zhang, J., & **Ma, E.** Antioxidant enzymes and their role in phoxim and carbaryl stress in *Caenorhabditis elegans*. *Pesticide biochemistry and physiology*, 2017.138, 43-50.
8. Zhao, X., Gou, X., Qin, Z., Li, D., Wang, Y., **Ma, E.**, ... & Zhang, J.. Identification and expression of cuticular protein genes based on *Locusta migratoria transcriptome*. *Scientific Reports*, 2017. 7. 45462.
9. Song, H., Zhang, J., Li, D., Cooper, A. M., Silver, K., Li, T., **Ma, E.**, ... & Zhang, J.. A double-stranded RNA degrading enzyme reduces the efficiency of oral RNA interference in migratory locust. *Insect biochemistry and molecular biology*, 2017.86, 68-80.
10. Han, P., Han, J., Fan, J., Zhang, M., **Ma, E.**, Li, S., ... & Zhang, J. 20-Hydroxyecdysone activates PGRP-SA mediated immune response in *Locusta migratoria*. *Developmental & Comparative Immunology*, 2017.72, 128-139.
11. Guo, Y., Wu, H., Zhang, X., Zhu, K. Y., **Ma, E** & Zhang, J. RNA interference of cytochrome P450 CYP6F subfamily genes affects susceptibility to different insecticides in *Locusta migratoria*. *Pest management science*, 2016. 72(11), 2154-2165.
12. Yu, Z., Zhang, X., Wang, Y., Moussian, B., Zhu, K. Y., Li, S., ... **Ma, E** & Zhang, J. LmCYP4G102: An oenocyte-specific cytochrome P450 gene required for cuticular waterproofing in the migratory locust, *Locusta migratoria*. *Scientific reports*, 2016. 6, 29980.
13. Han, Y., Song, S., Guo, Y., Zhang, J., & **Ma, E.** ace-3 plays an important role in phoxim resistance in *Caenorhabditis elegans*. *Ecotoxicology*, 2016. 25 (4), 835-844.
14. Zhang, X., Li, Y., Wang, J., Zhang, T., Li, T., Dong, W., ... **Ma, E.** & Zhang, J. Identification and characteristic analysis of the catalase gene from *Locusta migratoria*. *Pesticide biochemistry and physiology*, 2016. 132, 125-131.

15. Zhu, W., Yu, R., Wu, H., Zhang, X., Liu, Y., Zhu, K. Y., ... & Ma, E. Identification and characterization of two CYP9A genes associated with pyrethroid detoxification in *Locusta migratoria*. *Pesticide biochemistry and physiology*, 2016. 132, 65-71.
16. Dong, W., Zhang, X., Zhang, X., Wu, H., Zhang, M., Ma, E., & Zhang, J. Susceptibility and potential biochemical mechanism of *Oedaleus asiaticus* to beta-cypermethrin and deltamethrin in the Inner Mongolia, China. *Pesticide biochemistry and physiology*, 2016. 132, 47-52.
17. Yu, R., Liu, W., Li, D., Zhao, X., Ding, G., Zhang, M., ... Ma, E., & Zhang, J. Helicoidal organization of chitin in the cuticle of the migratory locust requires the function of the chitin deacetylase 2 enzyme (LmCDA2). *Journal of Biological Chemistry*, 2016. jbc-M116.
18. Zhang, J., Ge, P., Li, D., Guo, Y., Zhu, K. Y., Ma, E., & Zhang, J. Two homologous carboxylesterase genes from *Locusta migratoria* with different tissue expression patterns and roles in insecticide detoxification. *Journal of insect physiology*, 2015. 77, 1-8.

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