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曾任森

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一、个人简介

曾任森,男, 1965年8月出生。博士, 教授, 博士生导师, 福建农林大学作物科学学院院长, 作物抗性与化学生态学研究所所长。首批教育部新世纪优秀人才培养计划入选者, 广东省珠江学者特聘教授, 广东省高校“千百十”工程国家级学术带头人培养对象。先后兼任国际化感作用学会 (International Allelopathy Society) 理事长、国际化学生态学学会 (International Society of Chemical Ecology) 理事、海外华人昆虫学家协会 (Overseas Chinese Entomologists Association) 主席、国际昆虫学年评杂志 (Annual Review of Entomology, SCI期刊, IF 13.53) 编委、Frontiers in Plant Science (IF 4.1) 编委、Frontiers in Microbiology (IF 4.2) 编委、国际化学生态学杂志 (Journal of Chemical Ecology, SCI期刊, IF 2.4) 编委、Journal of Allelochemical Interactions编委, 《中国农业科学》和《应用生态学报》编委会委员。中国昆虫学会昆虫化学生态学专业委员会副主任委员和中国生态学学会农业生态学专业委员会委员, 福建省生态学学会副理事长, 福建省昆虫学会常务理事。主持的《农业生态学》双语教学课程入选国家级双语教学示范课程和省精品课程, 共同主讲的《生态文明: 撑起美丽中国梦》入选国家级精品在线开放课程, 《耕作学》入选省级网络精品课程。

1985年江西农业大学农学专业本科毕业, 分别于1991年和2000年获华南农业大学生态学理学硕士和博士学位。1991年至2014年3月在华南农业大学农学院从事植物与微生物、植物与植物以及植物与昆虫之间化学相互关系研究。期间, 1991年10月至1992年12月在南开大学元素有机化学国家重点实验室从事植物活性物质的分离和鉴定研究工作。2001年4月至2002年2月在加拿大湖头大学进行合作研究。2005年2月至2006年8月以及2012年8-11月在美国伊利诺大学美国科学院院士、著名化学生态学家和昆虫学家May R. Berenbaum教授实验室访问学者。2014年4月调入福建农林大学工作。2014年9月至2016年11月担任福建农林大学生命科学学院院长, 2016年12月至今担任福建农林大学作物科学学院院长。

主要从事化学生态学、作物抗性机理、植物与昆虫和微生物互作研究, 近年来主持各类科研课题30多项, 其中主持国家自然科学基金各类项目13项。在国内外发表学术论文130多篇, 其中在*PNAS*, *Annual Review of Entomology*, *New Phytologist*, *Plant Cell and Environment*等国外SCI核心刊物发表论文86篇。主编的英文著作“*Allelopathy in Sustainable Agriculture and Forestry*可持续农业和林业中的化感作用”由国际知名的Springer出版社 (科学技术领域国际第一大图书出版商) 在美国纽约出版。主持召开国际会议4次, 多次在国际会议上做大会特邀报告。先后与加拿大、美国、澳大利亚和德国等国家的科学家建立了紧密的国际合作关系。加拿大、西班牙、巴基斯坦等多国访问学者到所在的化学生态学实验室从事合作研究半年以上。

二、研究方向与领域

作物（主要以水稻、玉米和番茄为研究对象）抗虫抗病的化学生态学机理及其信号转导途径，作物养分（氮和硅）和栽培措施与作物抗性的关系及其机理，植物化感作用，作物与昆虫和微生物的互动，作物与菌根共生的化学生态学机理，外来生物入侵的机理与防控。

三、代表性成果

（一）近年发表的论文有(#表示共同第一作者；*表示通讯作者):

- (1)Chen DM[#], Chen DQ[#], Xue RR[#], Long J, Lin XH, Lin YB, Jia LH, Zeng RS, Song YY*. Effects of boron, silicon and their interactions on cadmium accumulation and toxicity in rice plants. *Journal of Hazardous Materials*. 2019, 367: 447-455.
- (2)Chen S[#], Esmail Abdalla Elzaki M[#], Ding CH, Li ZF, Wang J, Zeng RS*, Song YY*. Plant allelochemicals affect tolerance of polyphagous lepidopteran 3 pest *Helicoverpa armigera* (Hübner) against insecticides. *Pesticide Biochemistry and Physiology*, 2019, 154:32-38.
- (3)Sun ZX[#], Shi Q[#], Li QL, Wang RM, Xu CC, Wang HH, Ran CX, Song YY*, Zeng RS*. Identification of a cytochrome P450 *CYP6AB60* gene associated with tolerance to multi-plant allelochemicals from a polyphagous caterpillar tobacco cutworm (*Spodoptera litura*). *Pesticide Biochemistry and Physiology*, 2019, 154: 60-66.
- (4)Li QL[#], Sun ZX[#], Shi Q, Wang RM, Xu CC, Wang HH, Song YY*, Zeng RS*. RNA-Seq analyses of midgut and fat body tissues reveal the molecular mechanism underlying *Spodoptera litura* resistance to tomatine. *Frontiers in Physiology*, 2019, doi: 10.3389/fphys.2019.00008.
- (5)Sun ZX[#], Xu CC[#], Chen S[#], Shi Q, Wang HH, Wang RM, Song YY*, Zeng RS*. Exposure to herbicides primes p450-mediated detoxification of *Helicoverpa armigera* against insecticide and fungal toxin. *Insects*, 2019, 10(1): 28- doi: 10.3390/insects10010028.
- (6)Elzaki MEA, Xue RR, Hu L, Wang JD, Zeng RS, Song YY*. Bioactivation of aflatoxin B1 by a cytochrome P450, CYP6AE19 induced by plant signaling methyl jasmonate in *Helicoverpa armigera* (Hübner). *Pesticide Biochemistry and Physiology*, 2019, 157: 211-218. doi: 10.1016/j.pestbp.2019.03.020

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- (8) Lin YB, Sun ZX, Li ZF, Xue RR, Cui WK, Sun SZ, Liu TT, Zeng RS, Song YY*. Deficiency in silicon transporter Lsil compromises inducibility of anti-herbivore defense in rice plants. *Frontiers in Plant Science*. 2019, 10: 652
- (9) Chen DQ, Shao M, Sun SZ, Liu TT, Zhang H, Qin NN, Zeng RS and Song YY. Enhancement of jasmonate-mediated antiherbivore defense responses in tomato by acetic acid, a potent inducer for plant protection. *Frontiers in Plant Science*. 2019, 10:764. doi: 10.3389/fpls.2019.00764
- (10) Gu CZ, Xia XM, Lv J, Tan JW, Baerson S R, Pan ZQ, Song YY*, Zeng RS*. Diterpenoids with herbicidal and antifungal activities from hulls of rice (*Oryza sativa*). *Fitoterapia*, 2019, 136: 104183.
- (11) Lu K, Wang Y, Chen X, Zhang XY, Li WR, Cheng YB, Li Y, Zhou JM, You KK, Song YY, Zhou Q*, Zeng RS*. Adipokinetic hormone receptor mediates trehalose homeostasis to promote vitellogenin uptake by oocytes in *Nilaparvata lugens*. *Frontiers in Physiology*, 2019, 9: 1904, doi: 10.3389/fphys.2018.01904.
- (12) Gu CZ, Yuan SH, Lv J, Qiao YJ, Song YY, Esmail Abdalla Elzaki M, Yang CR, Zhang YJ*, Zeng RS*. Albocycline-type macrolides with antibacterial activities from *Streptomyces* sp. 4205. *Chemistry & Biodiversity*, 2019, 16, e1800344.
- (13) Wu XY, Ding CH, Baerson SR, Lian L, Lin XH, Zhang LQ, Wu C F, Hwang S H, Zeng RS*, Song YY*. The roles of jasmonate (JA) signaling in nitrogen uptake and allocation in rice (*Oryza sativa* L.). *Plant Cell & Environment*, 2019, 42: 659–672.
- (14) Hu L, Xia M, Lin XH, Xu CC, Li W, Wang J, Zeng RS*, Song YY*. Earthworm gut bacteria increase silicon bioavailability and acquisition by maize. *Soil Biology and Biochemistry*, 2018, 125: 215–221.
- (15) Sun ZX#, Shi Q#, Xu CC, Wang RM, Wang HH, Song YY*, Zeng RS*. Regulation of *NIE74A* on vitellogenin might be mediated by angiotensin converting enzyme through a fecundity-related SNP in the brown planthopper, *Nilaparvata lugens*. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology*, 2018, 225: 26–32.
- (16) Wang J*, Yang M, Song Y, Acevedo F E, Hoover K, Zeng RS, Felton GW. Gut-associated bacteria of *Helicoverpa zea* indirectly trigger plant defenses in maize. *Journal of Chemical Ecology*, 2018. 44: 690–699.

- (17)Sun ZX, Kang K, Cai YJ, Zhang J Q, Zhai Y F,Zeng RS,Zhang WQ*. Transcriptional regulation of the vitellogenin gene through a fecundity - related single nucleotide polymorphism within a GATA-1 binding motif in the brown planthopper, *Nilaparvata lugens*. *Insect Molecular Biology*, 2018, 27(3): 365-372.
- (18)Hu L, Balusu RR, Zhang WQ, Ajayi OS, Lu YY,Zeng RS, Chen L. Intra-and inter-specific variation in alarm pheromone produced by *Solenopsis* fire ants. *Bulletin of Entomological Research*, 2018, 108(5): 667-673.
- (19)Wang J, Peiffer M, Rosa C, Hoover K,Zeng RS,Felton G W. *Helicoverpa zeagut*-associated bacteria indirectly induce defenses in tomato through mediating salivary elicitor(s). *New Phytologist*. 2017, 214: 1294-1306..
- (20)Ye M, Song YY, Baerson SR, Long J, Wang J, Pan Z, Lin WX,Zeng RS*. Ratoon rice generated from primed parent plants exhibit enhanced herbivore resistance. *Plant Cell and Environment*. 2017, 40: 779-787.
- (21)Wu XY, Yu YG, Baerson SR, Song YY, Liang GH,Ding CH, Niu JB, Pan Z,Zeng RS*. Interactions between nitrogen and silicon in rice and their effects on resistance towards the brown planthopper *Nilaparvata lugens*. *Frontiers in Plant Science*. 2017, 8:28.
- (22)Wang RL, Zhu-Salzman K, Baerson SR, Xin XW, Li J, Su YJ,Zeng RS*. Identification of a novel cytochrome P450 CYP321B1 gene from tobacco cutworm (*Spodoptera litura*) and RNA interference to evaluate its role in commonly used insecticides. *Insect Science*. 2017, 24: 235-247.
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- (24)Niu JB, Wang RL, Chen CY, Jia LH, Song YY,Zeng RS*. Over-expression of *OsCPS2* and *OsCPS4* enhanced allelopathic potential in rice (*Oryza sativa*). *Allelopathy Journal*. 2017, 41(2): 259-268.
- (25)Wang J, Chung SH, Peiffer M, Rosa C, Hoover K,Zeng RS,Felton GW. Herbivore oral secreted bacteria trigger distinct defense responses in preferred and non-preferred host plants. *Journal of Chemical Ecology*. 2016, 42: 463-474.
- (26)Reynolds OL, Gurr G, Padula M,Zeng RS. Silicon: potential to promote direct and indirect effects on plant defence against arthropod pests. *Frontiers in Plant Science*. 2016. 7: 744 doi: 10.3389/fpls.2016.00744.

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- (28) Zhang HY, Zeng RS, Chen DY, Liu J*. A pivotal role of vacuolar H⁺-ATPase in regulation of lipid production in *Phaeodactylum tricornutum*. *Scientific Reports*, 2016, 6: 31319.
- (29) Zhu-Salzman K and Zeng RS. Insect response to plant defensive protease inhibitors. *Annual Review of Entomology*. 2015, 60:233–252.
- (30) Zeng RS. Introduction. *Annual Review of Entomology*. 2015, 60: V–VI.
- (31) Wang RL, Li J, Staehelin C, Xin XW, Su YJ, Zheng SC, Zeng RS*. Expression analysis of two P450 monooxygenase genes of the tobacco cutworm moth (*Spodoptera litura*) at different developmental stages and in response to plant allelochemicals. *Journal of Chemical Ecology*. 2015. 41: 111–119.
- (32) Song YY, Simard SW*, Carroll A, Mohn WW, Zeng RS. Defoliation of interior Douglas-fir elicits carbon transfer and stress signaling to ponderosa pine neighbors through ectomycorrhizal networks. *Scientific Reports*, 2015, 5: 8495
- (33) Li XX, Zhao J, Tan ZY, Zeng RS, Liao H*. GmEXPB2, a cell wall β -expansin gene, regulates affects soybean nodulation through modifying root architecture and promoting nodule formation and development. *Plant Physiology*. 2015. 169: 2640–2653.
- (34) Wang RL, Xia QQ, Baerson SR, Ren Y, Wang J, Su YJ, Zheng SC, Zeng RS*. Identification of a novel cytochrome P450 CYP6AB14 gene in *Spodoptera litura* (Lepidoptera: Noctuidae) and evaluation of its role in plant allelochemical detoxification via RNA interference. *Journal of Insect Physiology*. 2015. 75: 54–62.
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- (37) Appiah K, Li Z, Zeng RS, Luo SM, Oikawa Y, Fujii Y*. Determination of allelopathic potentials in plant species in Sino-Japanese floristic region by sandwich method and dish pack method. *International Journal of Basic and Applied Sciences*. 2015, 4 (4): 381-394.
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- (42) Song YY, Ye M, Li CY, Wang RL, Wei XC, Luo SM, Zeng RS*. Priming of anti-herbivore defense in tomato by arbuscular mycorrhizal fungus and involvement of the jasmonate pathway. *Journal of Chemical Ecology*, 2013, 39(7): 1036-1044.
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- (44) Zeng RS, Wen Z, Niu G, Berenbaum MR. Aflatoxin B1: toxicity, bioactivation and detoxification in the polyphagous caterpillar *Trichoplusia ni*. *Insect Science*. 2013, 20:318-328.
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- (48)Song YY, Cao M, Xie LJ, Liang XT, Zeng RS*, Su YJ, Huang JH, Wang RL, Luo SM. Induction of DIMBOA accumulation and systemic defense responses as a mechanism of enhanced resistance of mycorrhizal corn (*Zea mays*L.) to sheath blight (*Rhizoctonia solani*). *Mycorrhiza*, 2011, 21: 721–731.
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- (50)Gao D, Cai KZ*, Chen JN, Luo SM, Zeng RS, Yang JY, Zhu XY. Silicon enhances photochemical efficiency and adjusts mineral nutrient absorption in *Magnaporthe oryzae* infected rice plants. *Acta Physiol Plant*. 2011, 33(3):675–682.
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- (63)Liu YH, Zeng RS*, Liu DL, Luo SM, Wu HW, An M. Modelling dynamics of plant defence volatiles using the An-Liu-Johnson-Lovett model. *Allelopathy Journal*. 2006, 18(2): 215-224.
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- (66)Zeng RS*, Luo SM, Shi YH, Shi MB, Tu CY. Physiological and biochemical mechanism of allelopathy of secalonic acid F on higher plants. *Agronomy Journal*. 2001, 93(1):72-79.

(二) 主编和参编的论著、教材

- (1) Zeng RS (主编), Mallik AU, Luo SM(eds). 2008. Allelopathy in sustainable agriculture and forestry. Springer, New York(英文), pp 1-412.
- (2) Zeng RS(参编一章). Roles of allelochemicals induced by mycorrhizal fungi in disease resistance of plants. In “Allelochemicals: biological control of plant pathogen and diseases”, Inderjit and K.G. Mukerji (Eds.), Springer, Dordrecht, Netherlands, 2006, pp181-192 (英文)

- (3) 骆世明主编. 农业生态学, 农业出版社, 2009, 全国面向21世纪课程教材. (曾任森参编)
- (4) 曹凑贵主编, . 生态学概论, 高等教育出版社, 2006, 全国面向21世纪课程教材. (曾任森参编)
- (5) 林文雄, 陈雨海, 曾任森 (副主编) 等. 农业生态学, 高等教育出版社, 2015, 全国全国高等农林院校基础课程教材.

(三) 专利:

- (1) 国家发明专利: 薇甘菊萎蔫病毒基因诊断试剂盒及检测方法, 2012, 专利号: ZL-2012-1-0027972.0. 发明人: 王瑞龙, 曾任森, 梁笑婷, 辛效威, 宋圆圆, 苏贻娟, 骆世明。
- (2) 国家发明专利: 利用薇甘菊萎蔫病毒生物控制薇甘菊的试剂盒与方法, 2014, 专利号: ZL-2013-1-0311469.2. 发明人: 王瑞龙, 曾任森, 郑子豪, 任勇, 张晖, 宋圆圆, 苏贻娟。
- (3) 国家发明专利: 不同辣椒品种间作缓解连作障碍和控制病虫害的种植方法, 2015, 申请号: 201310662315.8, 公开(公告)号: CN 103688709A, 发明人: 王瑞龙, 曾任森, 王国庆, 董朝霞, 郑子豪, 张晖, 苏贻娟。

四、近年主持的科研课题

1. 国家自然科学基金项目“二萜化合物在水稻抗虫中的功能”(31670414) (2017.1--2020.12).
2. 国家自然科学基金项目“丛枝菌根菌丝桥介导的玉米与番茄植株间的化学通讯及其信号分子”(31070388) (2011.1--2013.12).
3. 国家自然科学基金项目“信号转导途径和稻壳酮合成关键酶基因沉默对水稻化感作用的影响”(30870390) (2009.1--2011.12).
4. 国家自然科学基金项目“丛枝菌根菌丝桥传递番茄植株间抗病信号的生化和分子机制”(30670331) (2007.1--2009.12).
5. 国家自然科学基金海外学者合作项目(国内合作者)“斜纹夜蛾适应大豆防御蛋白的机理”(31028018) (2011.1--2012.12).
6. 教育部博士点基金项目“防御信号转导途径关键酶基因沉默对水稻抗虫性的影响”(20104404110004) (2011.1--2013.12).
7. 国家重点基础研究973计划“作物多样性对病虫害生态调控和土壤地力的影响”(2011CB100400)子课题:作物多样性控制病虫害的化学机理(2011.1-2015.12).
8. 广东省高层次人才项目“水稻诱导抗虫的机理与信号转导途径”(2012.1-2014.12).
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