

## TED C. MACRAE

### HOME

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### OFFICE

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## KEY CAREER ACCOMPLISHMENTS

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- Key role in development and commercialization of Intacta RR2 Pro<sup>®</sup> in South America, the first transgenic insect-protected crop developed exclusively for an ex-U.S. market.
- Technical leadership in development of methods for understanding spectrum and degree of insecticidal activity and interactive potential of *Bacillus thuringiensis*  $\delta$ -endotoxins.
- Developed first artificial diet bioassays for *Lygus* and stink bugs.
- Designed, implemented, and initiated automation of insecticidal protein screen that is the basis of Monsanto's present-day discovery effort.
- Widely recognized as an entomological technical resource for questions regarding field trial design and conduct, rearing methods, bioassay design, basic biology, and taxonomy.

## EDUCATION

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- **B.S. General Agriculture**, December 1979. University of Missouri-Columbia. GPA 3.3/4.0. Recipient of the Phillip C. Stone Award in Entomology, May 1979.
- **M.S. Entomology**, December 1981. University of Missouri-Columbia. GPA 3.8/4.0. Thesis title: "Life history of *Forcipita loca* on three graminaceous hosts." Two publications (Quisenberry et al. 1983, MacRae & Yonke 1984).

## EXPERIENCE

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AREA ENTOMOLOGIST, 1982–1990

### Missouri Department of Agriculture, St. Louis, Missouri

Enforced Missouri Plant Law in St. Louis and surrounding counties in Missouri. Duties included plant pest inspection and certification, surveys for pests of regulatory importance, and survey and redistribution of beneficial organisms.

RESEARCH ENTOMOLOGIST, 1990–1992

STAFF RESEARCH ENTOMOLOGIST, 1993–1995

### Novo Nordisk Entotech, Inc., Davis, California

Established and supervised broad-spectrum insect rearing program to support bioevaluation of microbially derived insecticide candidates. Responsible for coordination of insect and greenhouse plant production; rearing and bioassay methods development; and staff supervision. Established quality control (QC) bioassay program to support product label requirements; Integrated

management of QC bioassay and Insectary activities and personnel. Responsible for GLP and non-GLP bioassay coordination; insect and greenhouse plant production; rearing and bioassay methods development; QC bioassay data analysis, management, and reporting; and staff supervision.

RESEARCH ENTOMOLOGIST, 1995

**AgraQuest, Inc., Davis, California**

Initiated insect rearing and bioassay programs for natural products insecticide discovery. Responsible for insect colony establishment and development of efficient, high-throughput, screening bioassays.

RESEARCH ENTOMOLOGIST, 1995–2011

SENIOR RESEARCH ENTOMOLOGIST, 2011–present

SCIENCE FELLOW, 2015–present

**Monsanto Company, St. Louis, Missouri**

1995–1997: Established insecticidal protein discovery screen. Responsible for development of efficient, high-throughput, feeding-based bioassays against multiple insect targets; optimization of artificial insect diets and rearing methods; coordination of bioassays and insect production; and staff supervision.

1998: Provided technical support for potato/specialty crop effort, including vegetables, sunflower, and alfalfa. Key contact for external cooperators evaluating insecticidal proteins for bioactivity.

1996–present: Lead entomologist for multiple insect-protected soybean projects. Established and managed diverse network of key academic and governmental cooperators in both the U.S. and South America to evaluate efficacy of transgenic soybean events and assess spectrum of activity and insect resistance management potential insecticidal proteins. Responsible for on-site and remote bioassay conduct/coordination, laboratory, greenhouse and field evaluation of soybean events, generation of data needed to support development of insect resistance management strategies, and identification of key entomological issues impacting commercialization of insect-protected soybean products. Project Lead for Bt/RR2Y Soybean (2005–2011) and Soy IP2 (2012–present).

ASSOCIATE INSTRUCTOR, FALL TERM, 1998–2000

**Maryville University, St. Louis, Missouri**

Co-taught Biology 302 “The Invertebrates.” Upper level undergraduate course focusing on diversity, evolution, and biology of invertebrate animals. Responsible for two lectures and two laboratory sessions per week and four exams per term.

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## **SYNERGISTIC EXPERIENCE**

PERSONAL RESEARCH

I have a strong interest in beetle taxonomy and have studied them actively for most of my adult life. This has involved extensive fieldwork throughout the U.S. as well as Mexico, Ecuador, Argentina, and South Africa and the assembly of an insect collection that now numbers close to 100,000 specimens. From 1982–1990 I studied the distribution, occurrence, and host associations of wood-boring beetles in Missouri, resulting in the documentation of ~350 species/subspecies in the state (nearly 100 representing new state records) and the identification of innumerable new host plant associations (MacRae 1991, 1994). My field work has also resulted in the discovery and description of several species new to science (Nelson & MacRae 1994; MacRae 2000, 2003, 2014; MacRae & Bellamy 2013) and better understanding of distributions and host plants for species

throughout the U.S. and Latin America (Nelson & MacRae 1990; Nelson et al. 1996; MacRae & Nelson 2003; MacRae 2004, 2006; MacRae & Bellamy 2013; MacRae & Basham 2013). More recently I conducted detailed faunal surveys of tiger beetles in the central U.S., clarifying the status of several species of conservation interest (Brown & MacRae 2011; MacRae & Brown 2011a, 2011b; Fothergill et al. 2011; MacRae et al. 2011). Strong writing skills and an interest in scientific publishing eventually led me to entomology journal editorial roles beginning 2005, and I now serve as Managing Editor for *The Pan-Pacific Entomologist* (along with several smaller editorial roles). Since 2009 I have taken up insect macrophotography and become a recognized authority and regular speaker within the entomology and nature photography communities. In addition to regular contributions to scientific journals and natural history newsletters, I write informally about entomology, insect photography and natural history at my personal website, [Beetles in the Bush](#) (905 articles posted).

#### EDITORIAL SERVICE

- *The Pan-Pacific Entomologist* (Journal of the Pacific Coast Entomological Society)
  - Coleoptera Subject Editor, 2005–2011 (55 manuscripts)
  - Managing Editor, 2011–present (27 issues, 365 manuscripts)
- *The Coleopterists Bulletin* (Journal of the Coleopterists Society)
  - Review Editor, 2016–present (18 manuscripts)
- *Journal of Insect Science* (An Entomological Society of America journal)
  - Taxonomy Subject Editor, 2016–present (8 manuscripts)
- *Cicindela* (A quarterly journal devoted to Cicindelidae)
  - Layout Editor, 2011–present (xx manuscripts)
- *Nature Notes* (Journal of the Webster Groves Nature Study Society)
  - Editor, 2009–present (79 issues)
- *Zootaxa* (A mega-journal for zoological taxonomists in the world)
  - Coleoptera Subject Editor, 2009–2011 (32 manuscripts)
- Manuscript Reviewer, 1994–present (65 papers, 7 books):
  - *Acta Biochimica et Biophysica Sinica*, 2006 (1)
  - *Acta entomologica musei nationalis Pragae*, 2016 (2)
  - *Annals of the Entomological Society of America*, 2015 (2)
  - *Arthropods*, 2011 (1)
  - *Biodiversity Data Journal*, 2014 (1)
  - *Folia Entomologica Mexicana*, 2004 (2)
  - *Insecta Mundi*, 2017 (1)
  - *Journal of the Arkansas Academy of Science*, 2013 (1)
  - *Northeastern Naturalist*, 2013 (1)
  - *Proceedings of the Entomological Society of Washington*, 2017 (1)
  - *Revista Acta Zoológica Mexicana*, 2013 (1)
  - *Systematic Entomology*, 2014 (1)
  - *The Canadian Entomologist*, 2001–2017 (2)
  - *The Coleopterists Bulletin*, 1994–2016 (17)
  - *The Maryland Entomologist*, 2008–2017 (6)
  - *Terrestrial Arthropod Review*, 2010–2014 (2)
  - *ZooKeys*, 2009–2016 (5)
  - *Zootaxa*, 2005–2011 (19)
  - Books, 2007–present (7)

- *An Annotated List of the Insects of Big Bend National Park* [families Buprestidae, Cerambycidae, Cicindelidae], by A. Van Pelt (2007), Big Bend National Park Association, 204 pp.
- *A Catalog and Bibliography of the Buprestoidea of America North of Mexico* [introduction], by G. H. Nelson et al. (2008), The Coleopterists Society, Special Publication No. 4, 274 pp.
- *World Catalogue and Bibliography of the Jewel Beetles (Coleoptera: Buprestoidea) Vol. 1* [introduction], by C. L. Bellamy (2008), Pensoft Publishers, 606 pp.
- *Jewel Beetles (Coleoptera: Buprestidae) of South Carolina*, by P. J. Harpootlian & C. L. Bellamy (2014), Clemson University Public Service Publishing, 127 pp.
- *Beetles of Eastern North America*, by A. V. Evans (2014), Princeton University Press, 560 pp.
- *Primary Types of Longhorned Woodboring Beetles (Coleoptera: Cerambycidae and Disteniidae) of the Smithsonian Institution*, by S. W. Lingafelter et al. (2014), Smithsonian Institution Scholarly Press, 390 pp.
- *Illustrated guide to the emerald ash borer, Agrilus planipennis Fairmaire and related species (Coleoptera, Buprestidae)*, by M. L. Chamorro et al. (2015), Pensoft Publishers, 198 pp.

#### PROFESSIONAL & AVOCATIONAL ASSOCIATIONS

- Center for Systematic Entomology, regular member, 1993–present
- Entomological Society of America, regular member, 1990–present
  - Taxonomy Subject Editor (*Journal of Insect Science*), 2016–present
- Florida State Collection of Arthropods, research associate, 1986–present
- Maryland Entomological Society, regular member, 2009–present
- Michigan Entomological Society, regular member, 1987–present
- Natural History Museum of Los Angeles County, field associate, 2001–present
- Pacific Coast Entomological Society, regular member, 1987–present
  - Coleoptera Subject Editor (*The Pan-Pacific Entomologist*), 2005–2011
  - Managing Editor (*The Pan-Pacific Entomologist*), 2011–present
- The Coleopterists Society, regular member, 1982–present
  - Review Editor (*The Coleopterists Bulletin*), 2016–present
- Webster Groves Nature Study Society, regular member, 1983–1990, 1996–present
  - Entomology Group, 1983–1990, 1996–present
  - Newsletter Editor (*Nature Notes*) & Board member, 2009–present
  - Education Committee member, 2011–2016

#### INTERNATIONAL EXPERIENCE

- Argentina: Sep 1996, Sep 1997, Mar 1999, May 1999, Feb 2000, May 2000, Feb 2001, June 2001, July 2002, Feb 2008, Mar 2011, Nov 2011, Feb–Apr 2012, Nov 2012, Feb–Mar 2013, Oct 2013, Feb–Mar 2014, Oct 2014, Feb–Mar 2015, Oct 2015, Jan–Feb 2016, Oct 2016, Feb–Mar 2017, Oct 2017
- Belgium: Aug 1988
- Brazil: Sep 1997, May 1999, May 2000, Aug 2000, Feb 2001, July 2002, Feb 2008, Jan 2011, Feb 2013, Oct 2017
- Canada: Aug 1999
- Denmark: Mar 1992, Nov–Dec 1992, Mar 1993, Aug 1993
- Dominican Republic: May 1982
- Ecuador: Dec 1989–Jan 1990
- France: July 2007, July 2010, July 2016

- Germany: Aug 1988
- Jamaica: June 2006
- Mexico: July 1992, Oct 2004, July–Aug 2005, Oct 2006, July 2014
- Netherlands: Aug 1988
- Russia: Dec 1996–Jan 1997, Oct 2002, Nov 2002
- South Africa: Nov–Dec 1999
- Sweden: Dec 1992

Native English-speaker, functional Spanish (verbal, reading, writing), limited Portuguese (reading).

## **AWARDS, PUBLICATIONS & PRESENTATIONS**

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### AWARDS

1. **1979 Phillip C. & Ruth E. Stone Award in Entomology.** University of Missouri, Department of Entomology, Columbia, MO.
2. **2008 Reggie Award.** Monsanto Company, St. Louis, MO. Best Performance, Scientific Excellence: Insect Bioassay Support Team: “Insect Bioassay Support for MON89034 and SmartStax”.
3. **2008 Above & Beyond Award.** Monsanto Company, St. Louis, MO. “First ever 5% reduced refuge for YieldGard VT PRO® and YieldGard VT Triple PRO Approvals that supports SmartStax Corn value capture”.
4. **2012 Above & Beyond Award** Monsanto Company, St. Louis, MO. Soy IP2 Project Team: “Acceleration of Second Generation INTACTA RR2 PRO”.
5. **2015 Above & Beyond Award.** Monsanto Company, St. Louis, MO. Agronomic Traits Insect Control Platform: “Rapid Advancement of Lepidopteran Insect Control Traits for Corn and Soybean”.
6. **2017 Edgar M. Queeny Award.** Monsanto Company, St. Louis, MO. “Intacta Soybean for South America”.

### OTHER RECOGNITIONS

1. **Technology Quarterly Recognition.** Monsanto Company, St. Louis, MO. “For accelerating the Soy Insect Protection 2 project to enable a Phase 3 transition in FY12” – Jan 2012.
2. **Technology Quarterly Recognition.** Monsanto Company, St. Louis, MO. “For developing quantitative bioactivity data for individual Soy IP2 traits to determine IRM characteristics for the full stack against key targets” – Jan 2013.
3. **Technology Quarterly Recognition.** Monsanto Company, St. Louis, MO. “For the screenhouse implementation to accelerate Ag Traits product assessment, which accelerates early phase gene efficacy decisions by replacing costly early open field efficacy trials in the US & Argentina” – Oct 2014.
4. **Technology Quarterly Recognition.** Monsanto Company, St. Louis, MO. “For development of a protein dose determination assay to support phase 2 transition of insect control projects” – Jan 2016.

### PATENTS/PATENT APPLICATIONS

1. Gao, A.-G., K. H. Kolacz, **T. C. MacRae**, J. A. Miklos, M. S. Paradise, F. J. Perlak, A. S. Toedebusch & L. A. Harrison. 2011. Soybean plant and seed corresponding to transgenic event MON87701 and methods for detection thereof. *US Patent No. US 8049071 B2*, issued 1 November 2011 [[abstract](#), [full text](#)].
2. Gao, A.-G., K. H. Kolacz, **T. C. MacRae**, J. A. Miklos, M. S. Paradise, F. J. Perlak & A. S. Dressel Toedebusch. 2013. Soybean plant and seed corresponding to transgenic event MON87701 and methods for detection thereof. *US Patent No. US 8455198 B2*, issued 4 June 2015 [[abstract](#), [full text](#)].
3. Beazley, K. A., W. C. Burns, R. H. Cole, II, **T. C. MacRae**, J. A. Miklos, L. G. Ruschke, K. Tian, L. Wei & K. Wu. 2014. Soybean Transgenic Event MON87751 and Methods for Detection and Use Thereof. *US Patent Application No. 20140373191*, issued 18 December 2014 [[full text](#)].

JOURNAL ARTICLES (BIOTECHNOLOGY)

1. **MacRae, T. C.**, M. E. Baur, B. J. Fitzpatrick, A.-G. Gao, J. C. Gamundi, L. A. Harrison, V. T. Kabuye, R. M. McPherson, J. A. Miklos, M. S. Paradise, A. S. Toedebusch & A. Viegas. 2005. Laboratory and field evaluations of transgenic soybean exhibiting high-dose expression of a synthetic *Bacillus thuringiensis cry1A* gene for control of Lepidoptera. *Journal of Economic Entomology* 98(2):577–587 [[pdf](#)].
2. Miklos, J. A., M. F. Alibhai, S. A. Bledig, D. C. Connor-Ward, A. Gao, B. A. Holmes, K. H. Kolacz, V. T. Kabuye, **T. C. MacRae**, M. S. Paradise, A. S. Toedebusch & L. A. Harrison. 2007. Characterization of soybean exhibiting high expression of a synthetic *Bacillus thuringiensis cry1A* transgene that confers a high degree of resistance to lepidopteran pests. *Crop Science* 47(1):148–157 [[pdf](#)].
3. McPherson, R. M. & **T. C. MacRae**. 2009. Assessing lepidopteran abundance and crop injury in soybean lines exhibiting a sythetic *Bacillus thuringiensis cry1A* gene. *Journal of Entomological Science* 44(2):120–131 [[pdf](#)].
4. McPherson, R. M. & **T. C. MacRae**. 2009. Evaluation of transgenic soybean exhibiting high expression of a synthetic *Bacillus thuringiensis cry1A* transgene for suppressing lepidopteran population densities and crop injury. *Journal of Economic Entomology* 102(4):1640–1648 [[pdf](#)].

JOURNAL ARTICLES (BIOSYSTEMATICS)

1. Quisenberry, S. S., **T. C. MacRae** & T. R. Yonke. 1983. Preference of *Forcipita loca* (Homoptera: Cicadellidae) adults to forage plants. *Environmental Entomology* 12(4):1149–1153 [[pdf](#)].
2. **MacRae, T. C.** & T. R. Yonke. 1984. Life history of *Forcipita loca* (Homoptera: Cicadellidae) on three graminaceous hosts. *Journal of the Kansas Entomological Society* 51(1):69–78 [[pdf](#)].
3. Nelson, G. H. & **T. C. MacRae**. 1990. Additional notes on the biology and distribution of Buprestidae (Coleoptera) in North America, III. *The Coleopterists Bulletin* 44(3):349–354 [[pdf](#)].
4. **MacRae, T. C.** 1991. The Buprestidae (Coleoptera) of Missouri. *Insecta Mundi* 5(2):101–126 [[pdf](#)].
5. **MacRae, T. C.** 1994. Annotated checklist of the longhorned beetles (Coleoptera: Cerambycidae and Disteniidae) known to occur in Missouri. *Insecta Mundi* 7(4) [1993]:223–252 [[pdf](#)].
6. Nelson, G. H. & **T. C. MacRae**. 1994. *Oaxacanthaxia nigroaenea* Nelson and MacRae, a new species from Mexico (Coleoptera: Buprestidae). *The Coleopterists Bulletin* 48(2):149–152 [[pdf](#)].
7. Nelson, G. H., R. L. Westcott & **T. C. MacRae**. 1996. Miscellaneous notes on Buprestidae and Schizopodidae occurring in the United States and Canada, including descriptions of previously unknown sexes of six *Agrilus* Curtis (Coleoptera). *The Coleopterists Bulletin* 50(2):183–191 [[pdf](#)].
8. **MacRae, T. C.** 2000. Review of the genus *Purpuricenus* Dejean (Coleoptera: Cerambycidae) in North America. *The Pan-Pacific Entomologist* 76(3):137–169 [[pdf](#)].
9. **MacRae, T. C.** & S. R. Penn. 2001. Additional records of adventive *Onthophagus* Latreille (Coleoptera: Scarabaeidae) in North America. *The Coleopterists Bulletin* 55(1):59–60 [[pdf](#)].
10. **MacRae, T. C.** 2001. Correction to holotype deposition of *Purpuricenus linsleyi* Chemsak (Coleoptera: Cerambycidae). *The Pan-Pacific Entomologist* 77(4):281 [[pdf](#)].
11. **MacRae, T. C.** & G. H. Nelson. 2003. Distributional and biological notes on Buprestidae (Coleoptera) in North and Central America and the West Indies, with validation of one species. *The Coleopterists Bulletin* 57(1):57–70 [[pdf](#)].
12. **MacRae, T. C.** 2003a. *Mastogenius guayllabambensis* MacRae, a new species from Ecuador (Coleoptera: Buprestidae: Haplostethini). *The Coleopterists Bulletin* 57(2):149–153 [[pdf](#)].
13. Sakalian, V., **T. C. MacRae**, S. Bílý & A. Sundholm. 2003. Comments on the proposed conservation of usage of *Acmaeodera* Eschscholtz, 1829 and *Acmaeoderella* Cobos, 1955 (Insecta, Coleoptera) by designation of *Buprestis cylindrica* Fabricius, 1775 as the type species of *Acmaeodera*. *Bulletin of Zoological Nomenclature* 60(3):218 [[pdf](#)].
14. **MacRae, T. C.** 2003b. *Agrilus* (s. str.) *betulanigrae* MacRae (Coleoptera: Buprestidae: Agrilini), a new species from North America, with comments on subgeneric placement and a key to the *otiosus* species-group in North America. *Zootaxa* 380:1–9 [[pdf](#)].
15. **MacRae, T. C.** 2004. Notes on host associations of *Taprocerus gracilis* (Say) (Coleoptera: Buprestidae) and its life history in Missouri. *The Coleopterists Bulletin* 58(3):388–390 [[pdf](#)].

16. Brown, C. R. & **T. C. MacRae**. 2005. Occurrence of *Cicindela* (*Cicindelidia*) *trifasciata ascendens* (Coleoptera: Cicindelidae) in Missouri. *Cicindela* 37(1–2):17–19 [[pdf](#)].
17. **MacRae, T. C.** 2006. Case 3302. *Buprestis sexsignata* Say, 1839 (Insecta, Coleoptera): proposed precedence of the specific name over those of *Chrysobothris ignipes* Gory & Laporte, 1838 and *Chrysobothris germari* Gory & Laporte, 1838. *Bulletin of Zoological Nomenclature* 63(1):36–38 [[pdf](#), ICZN Ruling [here](#)].
18. **MacRae, T. C.** 2006. Distributional and biological notes on North American Buprestidae (Coleoptera), with comments on variation in *Anthaxia* (*Haplantboxia*) *viridicornis* (Say) and *A. (H.) viridifrons* Gory. *The Pan-Pacific Entomologist* 82(2):166–199 [[pdf](#)].
19. **MacRae, T. C.**, J. Rifkind, R. L. Westcott & P. Zabransky. 2007. Case 3335. Comments on the proposed fixation of the feminine gender of the genus *Trachys* Fabricius, 1801 (Insecta, Coleoptera) and the form of derivation of family-group names based on *Trachys*. *Bulletin of Zoological Nomenclature* 64(1):64–66 [[pdf](#)].
20. **MacRae, T. C.** & M. E. Rice. 2007. Distributional and biological observations on North American Cerambycidae (Coleoptera). *The Coleopterists Bulletin* 61(2):227–263 [[pdf](#)].
21. **MacRae, T. C.** 2007. Comment on the proposed precedence of *Buprestis angustula* Illiger, 1803 (Insecta, Coleoptera) over *Buprestis pavida* Fabricius, 1793. *Bulletin of Zoological Nomenclature* 64(4):261 [[pdf](#)].
22. McDowell, W. T. & **T. C. MacRae**. 2009. First record of *Typocerus deceptus* Knull, 1929 (Coleoptera: Cerambycidae) in Missouri, with notes on additional species from the state. *The Pan-Pacific Entomologist* 84(4) [2008]:341–343 [[pdf](#)].
23. **MacRae, T. C.** 2009. The species of *Purpuricenus* Dejean (Coleoptera: Cerambycidae) occurring in Maryland. *The Maryland Entomologist* 5(1):5–10 [[pdf](#)].
24. Brown, C. R. & **T. C. MacRae**. 2011. Assessment of the conservation status of *Habrosclimorpha circumpicta johnsonii* (Fitch) in Missouri. *Cicindela* 42(4) [2010]:77–90 [[pdf](#)].
25. **MacRae, T. C.** & C. R. Brown. 2011a. Distribution, seasonal occurrence and conservation status of *Dromochorus pruinina* (Casey) in Missouri. *Cicindela* 43(1):1–13 [[pdf](#)].
26. **MacRae, T. C.** & C. R. Brown. 2011b. Historical and contemporary occurrence of *Cylindera* (s. str.) *celeripes* (LeConte) (Coleoptera: Carabidae: Cicindelinae) and implications for its conservation. *The Coleopterists Bulletin* 65(3):230–241 [[pdf](#)].
27. Fothergill, K., C. B. Cross, K. V. Tindall, **T. C. MacRae** & C. R. Brown. 2011. *Tetracha carolina* L. (Coleoptera: Cicindelidae) associated with polypipe irrigation systems in southeastern Missouri agricultural lands. *Cicindela* 43(3):45–58 [[pdf](#)].
28. **MacRae, T. C.**, C. R. Brown & K. Fothergill. 2011. Distribution, seasonal occurrence and conservation status of *Cylindera* (s. str.) *cursitans* (LeConte) (Coleoptera: Cicindelidae) in Missouri. *Cicindela* 43(3):59–74 [[pdf](#)].
29. **MacRae, T. C.** & R. L. Westcott. 2012. Nomenclatural history of *Melanophila drummondi* ab. *nicolayi* Obenberger, 1944 (Coleoptera: Buprestidae), a change of authorship and synonymy under *Phaenops drummondi* (Kirby 1837), and a new distribution record and summary of larval hosts for the species. *The Pan-Pacific Entomologist* 88(1):87–91 [[pdf](#)].
30. **MacRae, T. C.**, L. G. Bezark & I. Swift. 2012. Notes on distribution and host plants of Cerambycidae (Coleoptera) from southern México. *The Pan-Pacific Entomologist* 88(2):173–184 [[pdf](#)].
31. Steury, B. W., **T. C. MacRae** & E. T. Oberg. 2012. Annotated list of the metallic wood-boring beetles (Insecta: Coleoptera: Buprestidae) of the George Washington Memorial Parkway, Fairfax County, Virginia. *Banisteria* 39:71–75 [[pdf](#)].
32. **MacRae, T. C.** 2012. Occurrence of *Cicindelidia ocellata rectilatera* (Chaudoir) (Coleoptera: Cicindelidae) in Arkansas. *Cicindela* 44(3/4):49–54 [[pdf](#)].
33. **MacRae, T. C.** & C. L. Bellamy. 2013. Two new species of *Actenodes* Dejean (Coleoptera: Buprestidae) from southern Mexico, with distributional and biological notes on Buprestidae from Mexico and Central America. *The Pan-Pacific Entomologist* 89(2):102–119 [[pdf](#)].
34. **MacRae, T. C.** & J. P. Basham. 2013. Distributional, biological, and nomenclatural notes on Buprestidae (Coleoptera) occurring in the U.S. and Canada. *The Pan-Pacific Entomologist* 89(3):125–142 [[pdf](#)].
35. **MacRae, T. C.** 2014. *Acmaeodera chuckbellamyi* MacRae (Coleoptera: Buprestidae: Acmaeoderini), a new species from Arizona, USA. *The Coleopterists Bulletin* 68(1):50–52 [[pdf](#)].

36. **MacRae, T. C.** & B. D. Heinold. 2014. First records of *Ptilophorus wrightii* (LeConte 1868) (Coleoptera: Ripiphoridae) in Colorado and Oklahoma, with observations of female behavior. *The Pan-Pacific Entomologist* 90(1):47–52 [[pdf](#)].
37. Steury, B. W. & **T. C. MacRae**. 2014. The longhorned beetles (Insecta: Coleoptera: Cerambycidae) of the George Washington Memorial Parkway. The longhorned beetles (Insecta: Coleoptera: Cerambycidae) of the George Washington Memorial Parkway. *Banisteria* 44:7–12 [[pdf](#)].
38. Johnson, C. W., **T. C. MacRae**, C. Brownie, W. Virgets III & J. D. Allison. 2015. Observations of *Cerceris fumipennis* (Hymenoptera: Crabronidae) phenology and variation in its buprestid prey in Louisiana. *Florida Entomologist* 98(4):1106–1113 [[full text](#), [pdf](#)].
39. Scholtz, C. H. & **T. C. MacRae**. 2016. *Melanophila unicolor* Gory, 1841 (Buprestidae), the furnace beetle, in southern Africa. *African Entomology* 24:24(1):241–244 [[pdf](#)].
40. **MacRae, T. C.** 2016. *Chrysobothris bimaculata* (Coleoptera: Buprestidae), a new species from Jamaica, with a key to the genus in Jamaica. *Acta Entomologica Musei Nationalis Pragae* 56(1):1–5 [[pdf](#)].
41. Corona-López, A. M., Reza-Pérez, E. V., V. H. Toledo-Hernández, A. Flores-Palacios, **T. C. MacRae**, R. L. Westcott, H. A. Hespenheide & C. L. Bellamy. 2017. Diversity of Buprestidae (Coleoptera) from El Limón de Cuauichichinola, Tepalcingo, Morelos, Mexico. *The Pan-Pacific Entomologist* 93(2):71–83 [[pdf](#)].
42. Rice, M. E., F. Merickel & **T. C. MacRae**. 2017. The longhorned beetles (Coleoptera: Cerambycidae) of Idaho. *The Coleopterists Bulletin* 71(4):667–678 [[pdf](#)].

#### MAGAZINE/NEWSLETTER ARTICLES

1. **MacRae, T. C.** & C. R. Brown. 2001. Missouri Tigers. *Missouri Conservationist* 62(6):14–19 [[full text](#)].
2. **MacRae, T. C.** 2004. A new beetle for Missouri—with a twist! *Nature Notes, Journal of the Webster Groves Nature Study Society* 76(4):1, 12–13 [[pdf](#)].
3. **MacRae, T. C.** 2004. Beetle bits: Hunting the elusive “hibiscus jewel beetle”. *Nature Notes, Journal of the Webster Groves Nature Study Society* 76(5):4–5 [[pdf](#)].
4. **MacRae, T. C.** 2004. Beetle bits: A day with tomorrow’s entomologists. *Nature Notes, Journal of the Webster Groves Nature Study Society* 76(6):4–5 [[pdf](#)].
5. **MacRae, T. C.** & C. R. Brown. 2004. Bugs and birds: A nexus in Texas. *Nature Notes, Journal of the Webster Groves Nature Study Society* 76(10):2–6 [[pdf](#)].
6. **MacRae, T. C.** & C. R. Brown. 2005. Bugs and birds: A nexus in Texas (part 2). *Nature Notes, Journal of the Webster Groves Nature Study Society* 77(10):4–10, 14 [[pdf](#)].
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22. "Next Generation Transgenic IR Products in Soybeans". Entomological Society of America Annual Meeting, Member Symposium: *Transgenic Insect Resistant Soybeans*, Portland, Oregon, 19 November 2014 [[abstract](#)].
23. "From Hilltops to Swamps: Insects in Missouri's Rarest Prairies". Missouri Master Naturalists, Confluence Chapter, Weldon Spring, Missouri, 9 December 2014 [[pdf](#)].
24. "2<sup>nd</sup> Generation Transgenic Insect Protected Soybean". 2015 Soybean Breeders Workshop: Entomology and Agronomy; SESSION I: *Lepidoptera: A Metamorphosis in Management Strategies?* (Session Chair), St. Louis, Missouri, 17 February 2015.
25. "Antlions & Tiger Beetles & Woolly Bears, Oh My! A Local Entomologist's Look at Some of Missouri's More Interesting Insects". University of Guelph Entomology class field trip, Reis Biological Station, Steelville, Missouri, 30 April 2015 [[pdf](#)].

26. "Flash Lighting Techniques for Close-up and Macrophotography". Missouri Nature & Environmental Photographers, Clayton, Missouri, 20 October 2015 [[review](#)].
27. "Creating Insect Protected Crops through Biotechnology". Lewis & Clark Community College, Godfrey, Illinois, 2 December 2015.
28. "IB468 Classification & Evolution of Insects: Coleoptera & Strepsiptera". Guest Lecturer, University of Illinois at Urbana-Champaign, 7 December 2015.
29. "Classification & Evolution of Coleoptera & Strepsiptera". Webster Groves Nature Study Society Entomology Group Meeting, Chesterfield, Missouri, 17 April 2016.
30. "IRM value and potential for protein interaction in Bt soybean pyramids". International Congress of Entomology, Contributed Papers: *Ecology of Pesticides, Resistance, Toxicology, and Genetically Modified Crops*, Orlando, Florida, 30 September 2016 [[abstract](#)].
31. "Tigers in My Backyard: An Introduction to Missouri's Tiger Beetles and Their Conservation". Webster Groves Nature Study Society Entomology Group Meeting, Chesterfield, Missouri, 21 November 2016.
32. "Flash Lighting Techniques for Nature Photography". Webster Groves Nature Study Society, Nature Photography Group Meeting, Kirkwood, Missouri, 7 March 2017.
33. "Insect Macrophotography" (Guest Lecturer). Shaw Nature Reserve Photography Series, Eureka, Missouri, 9 Sep 2017.
34. "Antlions & Tiger Beetles & Woolly Bears, Oh My! A Local Entomologist's Look at Some of Missouri's More Interesting Insects". Webster Groves Nature Study Society Entomology Group Meeting, Chesterfield, Missouri, 20 November 2017 [[event](#)].

In addition to the above, innumerable presentations on science and entomology at local parks, elementary, middle and high schools, and community events.