



Dysschema sacrifica (Lepidoptera: Arctiidae): First Record on the Medicinal Plant Eremanthus erythropappus (Asteraceae) in Brazil

Authors: Fonseca, Arley José, Menezes, Claubert Wagner Guimarães De, Júnior, Sebastião Lourenço De Assis, Silveira, Rodrigo Diniz, Zanuncio, José Cola, et al.

Source: Florida Entomologist, 97(3) : 1266-1269

Published By: Florida Entomological Society

URL: <https://doi.org/10.1653/024.097.0340>

The BioOne Digital Library (<https://bioone.org/>) provides worldwide distribution for more than 580 journals and eBooks from BioOne's community of over 150 nonprofit societies, research institutions, and university presses in the biological, ecological, and environmental sciences. The BioOne Digital Library encompasses the flagship aggregation BioOne Complete (<https://bioone.org/subscribe>), the BioOne Complete Archive (<https://bioone.org/archive>), and the BioOne eBooks program offerings ESA eBook Collection (<https://bioone.org/esa-ebooks>) and CSIRO Publishing BioSelect Collection (<https://bioone.org/csiro-ebooks>).

Your use of this PDF, the BioOne Digital Library, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Digital Library content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne is an innovative nonprofit that sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

DYSSCHEMA SACRIFICA (LEPIDOPTERA: ARCTIIDAE): FIRST RECORD ON THE MEDICINAL PLANT *EREMANTHUS ERYTHROPAPPUS* (ASTERACEAE) IN BRAZIL

ARLEY JOSÉ FONSECA¹, CLAUBERT WAGNER GUIMARÃES DE MENEZES², SEBASTIÃO LOURENÇO DE ASSIS JÚNIOR³, RODRIGO DINIZ SILVEIRA⁴, JOSÉ COLA ZANUNCIO⁵ AND MARCUS ALVARENGA SOARES^{1*}

¹Departamento de Agronomia, Universidade Federal dos Vales do Jequitinhonha e Mucuri, 39.100-000, Diamantina, Minas Gerais State, Brazil

²Departamento de Agricultura, Universidade Federal de Lavras, 37200-000, Lavras, Minas Gerais State, Brazil

³Departamento de Engenharia Florestal, Universidade Federal dos Vales do Jequitinhonha e Mucuri, 39.100-000, Diamantina, Minas Gerais State, Brazil

⁴Departamento de Zootecnia, Universidade Federal dos Vales do Jequitinhonha e Mucuri, 39.100-000, Diamantina, Minas Gerais State, Brazil

⁵Departamento de Biologia Animal/BIOAGRO, Universidade Federal de Viçosa, 36.571-000, Viçosa, Minas Gerais State, Brazil

*Corresponding author; E-mail: marcusasoares@yahoo.com.br

Supplementary material for this article in Florida Entomologist 97(3) (2014) is online at <http://purl.fcla.edu/fcla/entomologist/browse>

The “Cerrado” biome (Savanna type) has a rich and diverse flora in Brazil (Myers et al. 2000; Barbosa & Fearnside 2004; Leite et al. 2012), showing the need for conservation measures of its natural resources (Lewinsohn et al. 2005; Leite et al. 2006; 2013). In Brazil, only 2.5% of the “Cerrado” is preserved as an Integral Protection Unit (Sparovek et al. 2010). This increases the impact of deforestation for wood extraction, fires and agricultural activities in this biome (Loyola et al. 2010; Pivello et al. 2010). Plant species in the Asteraceae family are found in the Brazilian “Cerrado” and used as a wood source, essential oils and secondary metabolites for industry and folk medicine (Batalha & Martins 2004; Fonseca et al. 2006). The “candeia” tree, *Eremanthus erythropappus* (DC.) MacLeish (Asteraceae), an arboreal plant, is found in mid-western, northeastern, southeastern and southern Brazil (Silverio et al. 2008). This species is suitable for the production of essential oils for the pharmaceutical and cosmetics industries (Sousa et al. 2008; Freitas et al. 2008).

Compounds from leaves, twigs and bark of *E. erythropappus* exhibit anti-inflammatory, analgesic and anti-ulcer activity (Braun et al. 2003; Nascimento et al. 2007; Silverio et al. 2008). The establishment of *E. erythropappus* plantations can reduce the indiscriminate exploitation of this plant in its natural environment. However, monocultures are susceptible to damage by defoliating insects and, therefore, knowledge of potential pest species is important for the Integrated Pest Management in these areas (Tavares et al. 2014).

Our objective was to identify and report the occurrence of an unknown lepidopteran species damaging *E. erythropappus* plants in the Cerrado area of Minas Gerais State, Brazil.

Immatures and adults of this unidentified lepidopteran were observed on *E. erythropappus* (Fig. 1A, 1B, 1C, 1D, 1E and 1F) in Jan 2013 in Diamantina (S 18° 18' -W 43° 36' W, 1,250 m asl, 1,082 mm average annual rainfall and 19.4 °C average temperature), Minas Gerais State, Brazil. Egg masses, larvae, pupae and adults of this lepidopteran were collected and sent to the Laboratory of Forest Entomology of the Federal University of the Jequitinhonha and Mucuri Valley (UFVJM) in Diamantina, Minas Gerais State, Brazil. Some of these adults were killed in killing chambers and sent to Dr. Paulo Sérgio Fiuza Ferreira, a taxonomist with Departamento de Entomologia, Universidade Federal de Viçosa in Viçosa, Minas Gerais State, Brazil. Dr. Ferreira identified it as *Dysschema sacrifica* (Hübner, 1831) (Lepidoptera: Arctiidae). Early larval instars of *D. sacrifica* fed by scraping *E. erythropappus* leaf surfaces while the older instars totally consumed the leaves. Pupae were found on the abaxial surface of the leaves, protected by a thin translucent web. Masses of white spherical eggs ca. 1 mm in diameter were also found on the abaxial leaf surfaces.

Adults of this species were collected and placed in screened wooden cages (50 × 40 × 40 cm) with 10% honey solution, *E. erythropappus* leaves and fan-folded paper for oviposition (Fig. 2). Mating was observed but no female oviposited in the

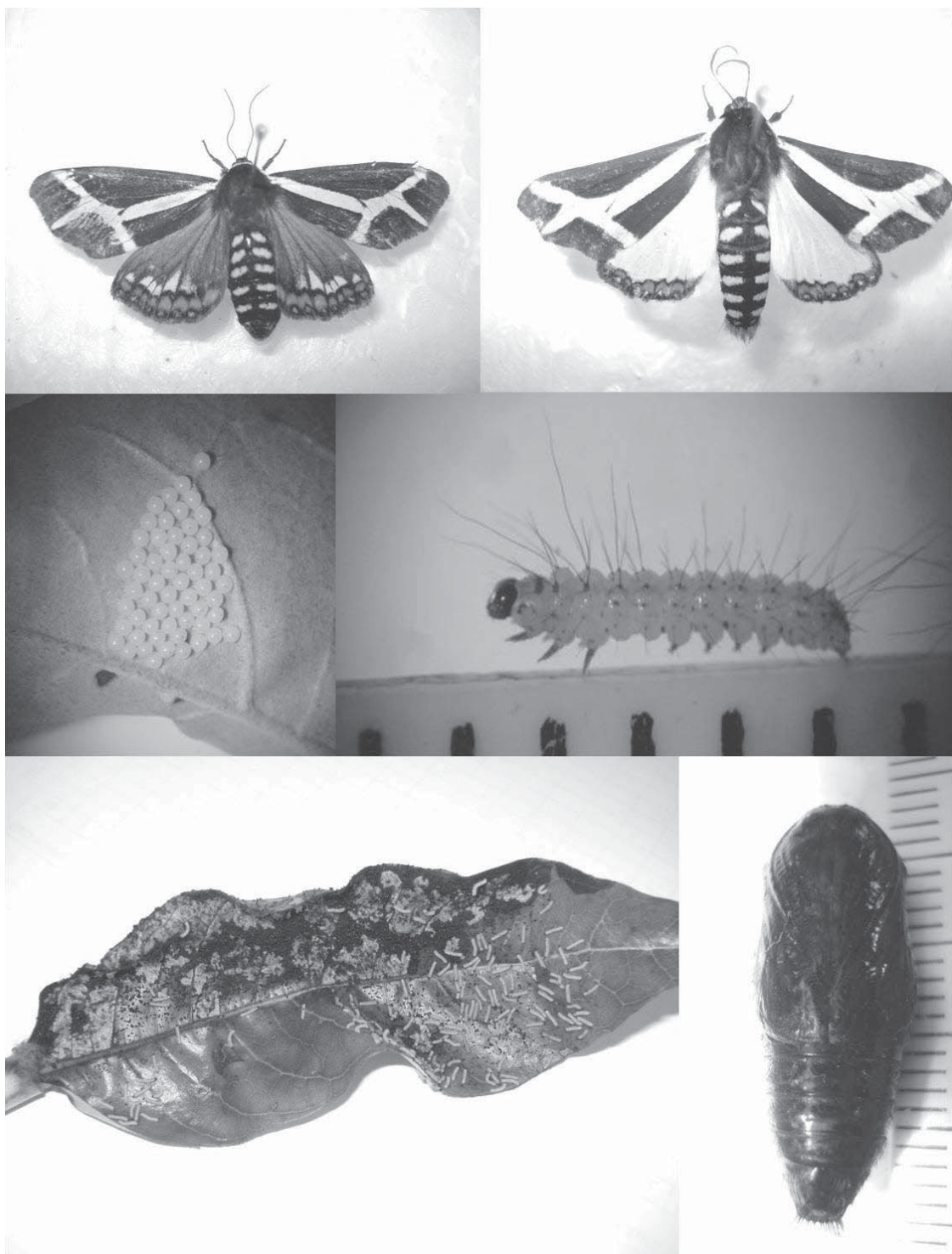


Fig. 1. *Dysschema sacrifica* (Lepidoptera: Arctiidae) at Diamantina, Minas Gerais State, Brazil: Upper left. female; Upper right. male; Middle left. egg mass; Middle right. caterpillar; Lower left. feeding damage by small caterpillars on the adaxial leaf surface of *Eremanthus erythropappus*; Lower right. pupa. This collage of images is shown online in color in supplementary material for this article in Florida Entomologist 97(3) (2014) at <http://purl.fcla.edu/fcla/entomologist/browse>.



Fig. 2. Cages for oviposition of *Dysschema sacrifica* (Lepidoptera: Arctiidae) adults collected on *Eremanthus erythropappus* at Diamantina, Minas Gerais State, Brazil. This collage of images is shown online in color in supplementary material for this article in Florida Entomologist 97(3) (2014) at <http://purl.fcla.edu/fcla/entomologist/browse>.

laboratory, thus the species biology could not be assessed.

The feeding damage caused by the larvae of *D. sacrifica* on *E. erythropappus* confirms its general feeding habit as a defoliator (Bai et al. 2010; Pankoke et al. 2012; Zaché et al. 2012). This insect is characterized by a white cross-like mark on the forewing. Adults exhibit sexual dimorphism in that females, which are usually larger than males, have brown hind wings whereas those of the males are white (Contreras Chialchia 2009).

The distribution of *D. sacrifica* involves various Brazilian biomes, including the Atlantic forest (semideciduous forest and Araucaria forest), Savannah and Southern Field (Steppe) biome (Ferro & Diniz 2007a, 2007b; Ferro & Teston 2009).

This is the first record of *D. sacrifica* feeding on *E. erythropappus* in Brazil, which shows the potential of the “candeia” tree as a food source and shelter for this insect.

We express our heartfelt thanks to “Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)”, “Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)” and “Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG)” for financial support, and to Dr. Paulo Sérgio Fiúza Ferreira, Departamento de Entomologia, Universidade Federal de Viçosa for identifying *D. sacrifica*.

SUMMARY

Dysschema sacrifica (Hübner, 1831) (Lepidoptera: Arctiidae) was found feeding on *Eremanthus erythropappus* (DC.) MacLeish (Asteraceae) plants in Diamantina, Minas Gerais State, Bra-

zil. Eggs, larvae and adults of this insect were collected on this host and sent for identification. This is the first record of *D. sacrifica* as a defoliator of this plant.

Key Words: candeia tree; defoliators; medicinal plants; pests

RESUMO

Dysschema sacrifica (Hübner, 1831) (Lepidoptera: Arctiidae) foi encontrada se alimentando em plantas de *Eremanthus erythropappus* (DC.) MacLeish (Asteraceae) em Diamantina, estado de Minas Gerais, Brasil. Ovos, imaturos e adultos deste inseto foram coletados neste hospedeiro e enviados para identificação. Este é o primeiro relato de *D. sacrifica* como desfolhador desta planta.

Palavras Chave: candeia; desfolhadores; plantas medicinais; pragas

REFERENCES CITED

- BAI, N. S., SASIDHARAN, T. O., REMADEVI, O. K., RAJAN, P. D., AND BALACHANDER, M. 2010. Virulence of *Metarhizium* isolates against the polyphagous defoliator pest, *Spilarcia obliqua* (Lepidoptera: Arctiidae). J. Trop. For. Sci. 22: 74-80.
- BARBOSA, R. I., AND FEARNside, P. M. 2004. Wood density of trees in open savannas of the Brazilian Amazon. For. Ecol. Mgt. 199: 115-123.
- BATALHA, M. A., AND MARTINS, F. R. 2004. Reproductive phenology of the cerrado plant community in Emas National Park (central Brazil). Australian J. Bot. 52: 149-160.
- BRAUN, N., MEIER, M., KOHLENBERG, B., AND HAMMERSCHMIDT, F. J. 2003. Two new bisabolone diols from the stem wood essential oil of *Vanillosmopsis erythropappa* Schultz-Bip (Asteraceae). J. Essential Oil Res. 15: 139-142.

- CONTRERAS CHIALCHIA, A. O. 2009. Distribución, caracterización y fenología de *Dysschema sacrificia* (Hübner, 1831) (Lepidoptera: Arctiidae) controlador biológico del *Senecio* (Amarantaceae) en la Ecorregión del Neembucú, Paraguay. *Azariana* 1: 61-68.
- FERRO, V. G., AND DINIZ, I. R. 2007a. Composição de espécies de Arctiidae (Insecta, Lepidoptera) em áreas de Cerrado. *Rev. Brasileira Zool.* 24: 635-646.
- FERRO, V. G., AND DINIZ, I. R. 2007b. Arctiidae (Insecta: Lepidoptera) da estação biológica de Boracéia (Salesópolis, São Paulo, Brasil). *Biota Neotrop.* 7: 331-338.
- FERRO, V. G., AND TESTON, J. A. 2009. Composição de espécie de Arctiidae (Lepidoptera) no sul do Brasil: relação entre tipos de vegetação e entre configuração espacial do habitat. *Rev. Brasileira Entomol.* 53: 278-286.
- FONSECA, M. C. M., MEIRA, R. M. S. A., AND CASALI, V. W. D. 2006. Anatomia dos órgãos vegetativos e histolocalização de compostos fenólicos e lipídicos em *Porophyllum ruderale* (Asteraceae). *Planta Daninha* 24: 707-713.
- FREITAS, V. L. O., LEMOS-FILHO, J. P., AND LOVATO, M. B. 2008. Contrasting genetic diversity and differentiation of populations of two successional stages in a neotropical pioneer tree (*Eremanthus erythropappus*, Asteraceae). *Genet. Mol. Res.* 7: 388-398.
- LEITE, G. L. D., VELOSO, R. V. S., ZANUNCIO, J. C., FERNANDES, L. A., AND ALMEIDA, C. I. M. 2006. Phenology of *Caryocar brasiliense* in the Brazilian cerrado region. *For. Ecol. Mgt.* 236: 286-294.
- LEITE, G. L. D., VELOSO, R. V. S., ZANUNCIO, J. C., ALMEIDA, C. I. M., FERREIRA, P. S. F., FERNANDES, G. W., AND SOARES, M. A. 2012. Habitat complexity and *Caryocar brasiliense* herbivores (Insecta: Arachnida: Araneae). *Florida Entomol.* 95: 819-830.
- LEITE, G. L. D., VELOSO, R. V. S., ZANUNCIO, J. C., FERNANDES, G. W., ALMEIDA, C. I. M., SERRÃO, J. E., AND SOARES, M. A. 2013. Seasonal abundance of gall-ing insects (Hymenoptera) on *Caryocar brasiliense* (Malpighiales: Caryocaraceae) trees in the Cerrado. *Florida Entomol.* 96: 797-809.
- LEWINSOHN, T. M., FREITAS, A. V. L., AND PRADO, P. I. 2005. Conservation of terrestrial invertebrates and their habitats in Brazil. *Conserv. Biol.* 19: 640-645.
- LOYOLA, P. D., CIANCARUSO, M. V., SILVA, I. A., AND BATALHA, M. A. 2010. Functional diversity of herbaceous species under different fire frequencies in Brazilian savannas. *Flora* 205: 674-681.
- MYERS, N., MITTERMEIER, R. A., MITTERMEIER, C. G., FONSECA, G. A. B., AND KENT, J. 2000. Biodiversity hotspots for conservation priorities. *Nature* 403: 853-858.
- NASCIMENTO, A. M., BRANDÃO, M. G., OLIVEIRA, G. B., FORTES, I. C., AND CHARTONE-SOUSA, E. 2007. Synergistic bactericidal activity of *Eremanthus erythropappus* oil or beta-bisabolene with ampicillin against *Staphylococcus aureus*. *Antonie van Leeuwenhoek* 92: 95-100.
- PANKOKE, H., BOWERS, M. D., AND DOBLER, S. 2012. The interplay between toxin-releasing β -glucosidase and plant iridoid glycosides impairs larval development in a generalist caterpillar, *Grammia incorrupta* (Arctiidae). *Biochem. Mol. Biol.* 42: 426-434.
- PIVELLO, V. R., OLIVERAS, I., MIRANDA, H. S., HARIDASAN, M., SATO, M. N., AND MEIRELLES, S. T. 2010. Effect of fires on soil nutrient availability in an open savanna in Central Brazil. *Plant Soil* 337: 111-123.
- SILVÉRIO, M. S., SOUSA, O. V., DEL-VECHIO-VIEIRA, G., MIRANDA, M. A., MATHEUS, F. C., AND KAPLAN, M. A. C. 2008. Propriedades farmacológicas do extrato etanólico de *Eremanthus erythropappus* (DC) McLeish (Asteraceae). *Rev. Brasileira Farmacogn.* 18: 430-435.
- SOUSA, O. V., SILVÉRIO, M. S., DEL-VECHIO-VIEIRA, G., MATHEUS, F. C., YAMAMOTO, C. H., AND ALVES, M. S. 2008. Antinociceptive and anti-inflammatory effects of the essential oil from *Eremanthus erythropappus* leaves. *J. Pharm. Pharmacol.* 60: 771-777.
- SPAROVEK, G., BERNDES, G., KLUG, I. L. F., AND BARRETO, A. G. O. P. 2010. Brazilian agriculture and environmental legislation: Status and future challenges. *Environ. Sci. Technol.* 44: 6046-6053.
- TAVARES, W. S., LEGASPI, J. C., LIMA, A. R., SOARES, M. A., PEREIRA, A. I. A., AND ZANUNCIO, J. C. 2014. *Pseudautomeris brasiliensis* (Lepidoptera: Saturniidae) and *Stenoma* sp. (Lepidoptera: Elachistidae) feeding on crops of *Ctenanthe kummeriana* (Marantaceae) in Brazil and an associate parasitoid, *Enicospilus tenuigena* (Hymenoptera: Ichneumonidae). *Ann. Entomol. Soc. America* 107: 413-423.
- ZACHÉ, B., ZACHÉ, R. R. C., DE SOUZA, N. M., DAL POGETTO, M. H. F. A., AND WILCKEN, C. F. 2012. Evaluation of *Trichospilus diatraeae* (Hymenoptera: Eulophidae) as parasitoid of the eucalyptus defoliator *Eupseudosoma aberrans* Schaus, 1905 (Lepidoptera: Arctiidae). *Biocontrol Sci. Technol.* 22: 363-366.