

# PHORETIC ARTHROPODS OF THE RED IMPORTED FIRE ANT, *Solenopsis invicta*, (HYMENOPTERA: FORMICIDAE) IN CENTRAL LOUISIANA



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## BACKGROUND AND OBJECTIVES

Since its unfortunate introduction into the United States in 1930 in Alabama (Creighton 1930), the red imported fire ant (*Solenopsis invicta* Buren) has sparked much consternation and research. This small insect, originally from Brazil, has spread across the South, and has now been found in areas of Delaware, Maryland, Virginia, and in southern Nevada and California. One means of dispersal are the nuptial flights (Figure 1) which are present throughout the year with the highest frequency occurring between May and July (Markin *et al.*, 1971).

Much research has been done on the fire ant's biology, ecology, and control measures. However, few studies have been conducted on the phoretic arthropods associated with the red imported fire ant. Since relatively little information is known about the phoretic associates of this ant, a study was conducted by the authors to compile a list of species associated with the monogyne colonies of this ant in central Louisiana.



Figure 1. Two female red imported fire ant alates preparing to lift off for nuptial flight.

## METHODS

Twenty nests were marked in a suburban yard in Pineville, Louisiana. Nests were checked daily between the hours of 12 and 3 p.m., for a 16-month period, starting in May, 2004. Alates were collected as the winged females and males prepared to fly (Figure 2). Female and male alates were placed into separate vials of ethanol at the time of collection. Arthropods collected phoretically on the ants were removed and mounted onto slides in Berlese medium. Arthropods remaining in the sediments were also mounted, identified, and recorded.



Figure 2. Collecting fire ant alates as they prepare to fly.

## RESULTS

A total of 4,663 phoretic arthropods were removed from alates of the red imported fire ant (Table 1). A wide variety of taxonomic groups were represented, including two insect and fourteen mite families, providing a total of 27 species. The arthropods fell into three classes: 1) True phoretic, with more than thirty specimens collected, 2) Probable phoretic, with collections between five and thirty specimens, and 3) Accidental phoretic, with less than five specimens collected.

Table 1. A list of the arthropods removed from red imported fire ant alates. The species are organized by taxonomic Superfamily or Family. Numbers of each species are given, as well as the name of the taxonomic identifier.

Family / Superfamily	Species	# Arthropods	Phoretic?	Taxonomist
LACINIPEDAE	<i>Crematogaster ex. vicina</i>	77	True	D. Walter
	<i>Geolaelaps sheathii</i>	386	True	D. Walter
ASCIDAE	<i>Myrmecaron sp.</i>	39	True	D. Walter
	<i>Blechnocera serrata</i>	1	Accidental	E. Lindquist
UROPODIDAE	<i>Phocolepis n. sp. procerifusus group</i>	2	Accidental	E. Lindquist
	<i>Oplitis moseri</i>	1903	True	J. Moser
PYGMEPHORIDAE	<i>Trachyrhopda whitcombii</i>	573	True	J. Moser
	<i>Podicalator sp.</i>	1	Accidental	A. Khaustov
MICRODIPLOIDAE	<i>Casaeandiplos itegzigi n. sp.</i>	9	Probable	A. Khaustov
	<i>Petalonium hofstetteri n. sp.</i>	32	True	A. Khaustov
NEOPHYGMERIDAE	<i>Imparipes louisianae n. sp.</i>	551	True	E. Ebermann
	<i>Scuticaris androsay</i>	2	Accidental	E. Ebermann
SCUTICARIDAE	<i>Scuticaris n. sp. cf. deserticola</i>	2	Accidental	E. Ebermann
	<i>Scuticaris natus n. sp.</i>	8	Probable	E. Ebermann
PHYTOSEIIDAE	<i>Scuticaris natus n. sp.</i>	16	Probable	E. Ebermann
	<i>Amblyseius sp.</i>	1	Accidental	E. Lindquist
TYSEIDAE	<i>Loria sp.</i>	1	Accidental	C. Waldborn
	<i>Xanodonsonium n. sp.</i>	6	Probable	W. Magowski
TETRANYCHOIDEA	<i>Pterobis sp.</i>	3	Accidental	C. Waldborn
	<i>Cleidiplysis n. sp.</i>	2	Accidental	J. Armine
EROPHYIDOEAE	<i>Rhopoglyphus n. sp.</i>	1	Accidental	B. O'Connor
	<i>Forcellina n. sp.</i>	1	Accidental	B. O'Connor
HISTIOSTOMATIDAE	<i>Histiostoma n. sp. #1</i>	608	True	S. With
	<i>Histiostoma n. sp. #2</i>	3	Accidental	S. With
TECTOCEPHEIDAE	<i>Tectocephus velatus</i>	1	Accidental	R. Norton
	<i>Cypholobus similis</i>	433	True	K. Christiansen
INSECTA: COLLEMBOLA	<i>Micromyrtil sp.</i>	1	Accidental	R. Gagné

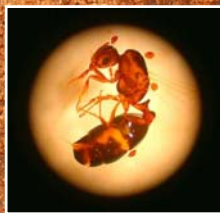


Figure 3. A female alate of *Solenopsis invicta* with several *Oplitis moseri* attached.



Figure 4. A newly described species, *Petalonium hofstetteri*, phoretic on *Solenopsis invicta*.



Figure 6. Hyperphoretic spores found to be associated with phoretic mites of *Solenopsis invicta*.



Figure 7. Head of a red imported fire ant loaded with phoretic *Oplitis moseri*.

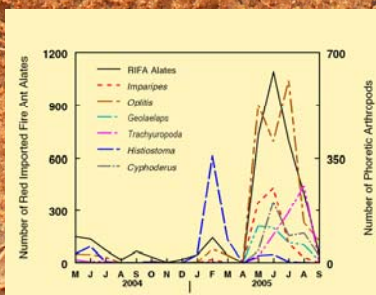


Figure 5. The monthly totals of red imported fire ant alates and six of the most frequently found phoretic arthropods.

## REFERENCES

Creighton, W. S. 1930. The new world species of the genus *Solenopsis*. Proceedings of the American Academy of Arts and Science. 66:88-89.

Markin, G. P., J. H. Dillier, S. O. Hill, M. S. Blum, and H. R. Hermann. 1971. Nuptial flight and flight ranges of the imported fire ant, *Solenopsis saevissima richteri* (Hymenoptera: Formicidae). Journal of Georgia Entomological Society. 6(3):145-156.