



## RESEARCH ARTICLE - ANTS

## Ants (Hymenoptera, Formicidae) of Saint Vincent, West Indies

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### Article History

#### Edited by

Jacques Delabie, UESC, Brazil

Received 12 March 2021

Initial acceptance 12 April 2021

Final acceptance 22 April 2021

Publication date 17 June 2021

#### Keywords

Ants; biogeography; exotic species; island biogeography; West Indies.

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### Abstract

The ants of Saint Vincent have long been one of the most thoroughly documented ant faunas of any Caribbean island. Ant specimens collected more than 100 years ago on St. Vincent include 76 valid taxa. In ten days surveying ants on Saint Vincent, I found eleven species not found by previous researchers. Eight are widespread Neotropical species (*Anochetus inermis*, *Camponotus claviscapus*, *Cyphomyrmex minutus*, *Odontomachus ruginodis*, *Pheidole exigua*, *Pheidole moerens*, *Rogeria curvipubens*, *Solenopsis corticalis*) and three are Old World exotics (*Cardiocondyla minutior*, *Sylophopsis sechellensis*, *Trichomyrmex destructor*). Ant records from St. Vincent include more Neotropical species (72) and fewer Old World exotic species (15) than the neighboring Caribbean islands of similar size: Barbados and Grenada. Factors that may contribute to this pattern are that, compared to Barbados and Grenada, Saint Vincent has more mountainous terrain, more intact forest, lower human population density, and fewer international tourist visits.

### Introduction

Many factors have shaped the biota of West Indian islands. Each island has a different balance of these forces related to the island's origin, age, topography, current and past size, and degree of access by potential biotic colonists. The result is a varied collection of natural experiments in island biogeography (Wilson, 1988). Barbados, Grenada, and Saint Vincent are the three southernmost major islands of the Lesser Antilles, a chain of oceanic island bordered to the south by the continental shelf islands of Trinidad and Tobago. In earlier papers, Wetterer et al. (2016, 2019) examined the ants of Barbados and Grenada. In the present study, I consider the ant fauna of St. Vincent.

St. Vincent is the largest island in the nation of St. Vincent and the Grenadines. The ant fauna of St. Vincent has long been one of the most thoroughly documented of any Caribbean island and as such has played a central role in defining the taxonomy of many Neotropical ant

species, largely thanks to the fieldwork of Herbert Huntington Smith (1851–1919), an American naturalist who made extensive ant collections on St. Vincent between May 1889 and January 1890. In total, 29 valid ant taxa (marked below with\*) were first described from St. Vincent. Before Smith's work, only one ant species had been reported from St. Vincent: *Neivamyrmex klugii*\* (Shuckard 1840). Smith's ant specimens from St. Vincent represent a total of 75 additional species (Forel, 1893, 1901, 1909, 1912; Emery 1894; Snelling, 2005). These include 63 Neotropical ant species (using current taxonomy): *Acropyga smithii*\*, *Anochetus mayri*, *Anochetus testaceus*\*, *Brachymyrmex minutus*\*, *Brachymyrmex obscurior*\*, *Camponotus auricomus vincentensis*\*, *Camponotus conspicuus sharpi*\*, *Camponotus sexguttatus*, *Cephalotes pallens*, *Crematogaster crinosa*, *Crematogaster curvispinosa*, *Cyphomyrmex rimosus*, *Dolichoderus lutosus*, *Dorymyrmex antillanus*\*, *Hypoconerops foeda*\*, *Hypoconerops opaciceps*, *Hypoconerops opacior*\*, *Leptogenys arcuata*, *Leptogenys mucronata*\*, *Leptogenys*



*pubiceps vincentensis*\*, *Linepithema iniquum*, *Monomorium ebeninum*\*, *Mycetomoellerius jamaicensis*, *Mycocepurus smithii*\*, *Myrmelachista ambigua*\*, *Nylanderia guatemalensis*, *Nylanderia pubens*\*, *Nylanderia steinheili*\*, *Odontomachus haematodus* (= *misidentified Odontomachus bauri*), *Pheidole antillana*\*, *Pheidole flavens*, *Pheidole godmani*\*, *Pheidole jelskii*, *Pheidole orbica*\*, *Pheidole radoszkowskii*, *Pheidole sculptior*\*, *Pheidole subarmata*, *Pheidole susanna*, *Platythyrea punctata*, *Prionopelta antillana*\*, *Pseudomyrmex curacaensis*, *Pseudomyrmex elongatus*, *Pseudomyrmex flavidulus*, *Pseudomyrmex gracilis*, *Pseudomyrmex simplex*, *Pseudomyrmex termitarius*, *Pseudoponera stigma*, *Rogeria foreli*\*, *Solenopsis azteca*\*, *Solenopsis basalis*, *Solenopsis castor*\*, *Solenopsis geminata*, *Solenopsis globularia*, *Solenopsis pollux*\*, *Solenopsis pygmaea*, *Solenopsis succinea*, *Strumigenys alberti*\*, *Strumigenys elongata*, *Strumigenys gundlachi*, *Strumigenys margaritae*\*, *Strumigenys smithii*, *Wasmannia auropunctata*, and *Wasmannia sigmoidea*. In addition, Smith's specimens included twelve cosmopolitan Old World tramp ant species, spread around the world by human commerce: *Cardiocondyla emeryi*, *Hypoconerina punctatissima*, *Leptogenys maxillosa*, *Monomorium floricola*, *Monomorium pharaonis*, *Paratrechina longicornis*, *Pheidole megacephala*, *Strumigenys emmae*, *Strumigenys rogeri*, *Tapinoma melanocephalum*, *Tetramorium bicarinatum*, and *Tetramorium simillimum*. Wheeler (1913) published collection of ants from the island of St. Vincent, listing five ant species that F.O. Hovey collected on St. Vincent, none of which were new records: *C. sexguttatus*, *D. antillanus*, *O. haematodus*, *P. stigma*, and *S. geminata*.

Here, I present site records from St. Vincent for ant species not collected by earlier researchers, based on my own collecting efforts. The presence of these species in St. Vincent listed in Wetterer et al. (2016, 2019) are based on the collection records reported here.

## Material & Methods

I twice collected ants on St. Vincent for a total of ten days: 8–10 June 2004 (12 sites) and 30 June – 6 July 2006 (30 sites). I collected primarily in heavily disturbed environment following standard methods used in numerous earlier ant faunal surveys (e.g., Wetterer & Wetterer, 2004; referred to as “direct sampling” by Bestelmeyer et al., 2000). The primary goal was to collect the maximum number of different ant species in the time allotted. To do this, I collected at numerous sites in the widest range of habitats accessible and permitted, spending more time at sites where the new or rare species accumulation rate was greater, and adjusting collecting techniques to best sample different habitats (Longino, 2000).

The vial numbers for the 42 sites were as follows (with geo-coordinates; date):

134. Arnos Vale, Riverside Apartments (13.148, -61.201, 8-Jun-04)

135–138. Arnos Vale, next to airport (13.142, -61.212, 8-Jun-04)  
139–141. Kingstown, botanical garden (13.168, -61.228, 8-Jun-04)

142. Kingstown, waterfront (13.157, -61.231, 9-Jun-04)

143. Reiland, side of road (13.191, -61.242, 9-Jun-04)

147–152. Vermont, Nature Trail (13.210, -61.224, 9-Jun-04)

144–146. Montreal Garden, under path stones (13.209, -61.189, 9-Jun-04)

153. Biabou, playing field (13.198, -61.137, 9-Jun-04)

154. Stubbs Bay, in litter on cliff face (13.147, -61.162, 9-Jun-04)

155–156. Calliaqua, W side of road (13.129, -61.191, 10-Jun-04)

157–162. Yambou Head, beachfront (13.165, -61.144, 10-Jun-04)

163–164. Calliaqua, by house (13.129, -61.184, 10-Jun-04)

581. Rose Cottage, by inn (13.136, -61.205, 30-Jun-06)

582–584. Spring, by beach (13.185, -61.142, 30-Jun-06)

585. Henry's Vale, bananas (13.319, -61.145, 30-Jun-06)

586–593. Ratho Hill, mango (13.127, -61.189, 30-Jun-06)

594–596. Belmont, by bar above school (13.165, -61.180, 30-Jun-06)

597–607. Wallilabou River, 0.3 km up river (13.313, -61.232, 1-Jul-06)

608–611. Richmond Beach, SW end of beach (13.310, -61.235, 1-Jul-06)

612–619. Trinity Falls, trailhead forest (13.305, -61.214, 1-Jul-06)

620–622. Dark View Falls, trailhead forest (13.292, -61.224, 1-Jul-06)

623–624. Coulls Corner, cliff (13.277, -61.256, 1-Jul-06)

625. Arnos Vale, in room (13.135, -61.202, 1-Jul-06)

626–643. Porter Point, by roadside shack (13.380, -61.166, 2-Jul-06)

644. Chateau, stream forest (13.377, -61.155, 2-Jul-06)

645–648. Sandy Bay, beach (13.364, -61.136, 2-Jul-06)

649–659. Orange Hill, forest patch (13.322, -61.124, 2-Jul-06)

660. Belle Vue, beach (13.234, -61.122, 2-Jul-06)

664. Kingstown, government area (13.155, -61.223, 3-Jul-06)

665–670. Wallilabou Falls, forest patch (13.246, -61.259, 3-Jul-06)

671–676. Hermitage, above reservoir (13.247, -61.212, 3-Jul-06)

677–678. Hermitage, by reservoir (13.247, -61.216, 4-Jul-06)

679–681. Grove, up N fork (13.245, -61.227, 4-Jul-06)

682–685. Peter's Hope, forest fragment (13.221, -61.273, 4-Jul-06)

686–687. Prospect, beach (13.126, -61.182, 4-Jul-06)

688–690. Georgetown, waterfront (13.279, -61.117, 5-Jul-06)

691–698. La Soufriere, 3.5 km W Rabacca (13.311, -61.146, 5-Jul-06)

699–705. La Soufriere trail, W of trailhead (13.318, -61.160, 5-Jul-06)

706–720. La Soufriere trail, trailhead parking (13.318, -61.156, 5-Jul-06)

721–724. Sans Souci, grass by beach (13.228, -61.126, 6-Jul-06)

725–729. Rabacca, S of dry river (13.299, -61.117, 6-Jul-06)

730–737. South Rivers, by dam above town (13.246, -61.152, 6-Jul-06)

I originally estimated site geo-coordinates using a printed map. I later made small corrections to some records using Google Earth. Unless otherwise stated, I made species identifications. Identification of some specimens was hampered by taxonomic problems in several genera, most notably *Brachymyrmex*, *Hypoponera*, *Nylanderia*, and *Solenopsis*. I therefore only present new species records that have been identified with confidence.

I deposited voucher specimens at the Museum of Comparative Zoology and the US National Museum of Natural History.

## Results

I collected eleven ant species on the island of St. Vincent not found by earlier researchers, bringing the total number to of ant species known from the island to 87.

This count does not include five ant species with records from smaller islands in the Grenadines, but not from the main island of St. Vincent: *Discothyrea humilis* on Petit Saint Vincent (antweb.org specimen CASENT0318490), *Neivamyrmex adnepos* on Isle à Quatre (CASENT0318513), *Neivamyrmex antillanus* on Union Island (CASENT0729238), *Tetramorium lanuginosum* on Canouan (Wetterer 2010) and Petit Canouan (CASENT0767676–9), and *Thaumatomyrmex zeteki* on Bequia (CASENT0318451).

## New species records

Numbers in parentheses refer to vial numbers listed above, with underlines grouping multiple vials from the same site.

**1. *Anochetus inermis*:** seven sites (2004: 139, 154; 2006: 585, 608, 664, 665, 730, 734).

Forel (1897) reported that all ant species that H.H. Smith collected in Grenada had also been found in St. Vincent, except one: *Anochetus inermis*. I found that this widespread Neotropical trap-jaw ant, known from the West Indies and South America, is relatively common on St. Vincent.

**2. *Camponotus claviscapus*:** one site (2006: 718).

This yellow-brown carpenter ant is known from South and Central America, as well as numerous West Indian islands (Wetterer et al., 2019). In the Lesser Antilles. I have also collected this species in Aruba, Bonaire, Curaçao, Grenada, Martinique, St. Lucia, and Trinidad. This species commonly nests in hollow twigs. *Camponotus claviscapus occultus* is known from Haiti and the Dominican Republic (Lubertazzi, 2019).

**3. *Cardiocondyla minutior*:** ten sites (2004: 153; 2006: 582, 585, 612, 626, 645, 649, 660, 691, 699).

*Cardiocondyla minutior* is an Indo-Malayan native that has become a cosmopolitan tramp species (Wetterer, 2014). Forel (1893) published a single record of *Cardiocondyla* from St. Vincent: *Cardiocondyla emeryi* from one site. I also collected

*C. emeryi* from just one site. All my other *Cardiocondyla* records were *C. minutior*.

**4. *Cyphomyrmex minutus*:** 24 sites (2004: 137, 138, 139, 141, 148, 154, 155, 164; 2006: 582, 594, 597, 598, 608, 612, 623, 644, 664, 665, 674, 677, 679, 682, 684, 686, 691, 695, 696, 701, 706, 707, 730).

*Cyphomyrmex minutus* is common across the West Indies, though it has often been misidentified as *Cyphomyrmex rimosus* (Snelling & Longino, 1992; Wetterer et al., 2016). Deyrup (2016) explain one way to distinguish the two species: “the most easily seen difference is the much greater development of the dorsal thoracic tubercles in *rimosus*. If one views the mesosoma from the front and imagines that the ant is large enough to ride, *minutus* would be an acceptable mount, while *rimosus* would be too uncomfortable to ride.”

**5. *Odontomachus ruginodis*:** seven sites (2004: 138, 155; 2006: 608, 644, 645, 665, 725).

*Odontomachus ruginodis* is a widespread Neotropical species (Wetterer et al., 2019). I collected this brown-headed trap-jaw ant much less often on St. Vincent than I collected its larger all-black congener *Odontomachus bauri* (see below). Exotic populations of this species are now spreading in Florida (Wetterer, 2020a).

**6. *Pheidole exigua*:** eight sites (2004: 139; 2006: 597, 599, 608–609, 612, 626, 707, 709, 712, 725, 730, 734). Identified by Stefan P. Cover.

This is a widespread Neotropical big-headed ant is known from South America, Central America, and the West Indies (Wilson, 2003).

**7. *Pheidole moerens*:** two sites (2006: 704, 706). Identified by Stefan P. Cover.

This Neotropical big-headed ant has been reported from many West Indian islands and from North America (Wetterer et al., 2019). Sarnat et al. (2015), however, found that records of *Pheidole moerens* from outside of the West Indies may all be based on misidentifications of *Pheidole navigans*.

**8. *Rogeria curvipubens*:** two sites (2004: 139; 2006: 586). Identification confirmed by David Lubertazzi.

*Rogeria curvipubens* is a widespread Neotropical species known from northern South America, Central America, and the West Indies (LaPolla & Sosa-Calvo, 2006; Wetterer et al., 2019).

**9. *Solenopsis corticalis*:** six sites (2006: 597, 673, 677, 682, 691, 696, 734). Identified by José Pacheco and William P. Mackay.

Concerning this tiny Neotropical thief ant, Pacheco and Mackay (2013) wrote: “Care must be taken in the Caribbean region where *S. pollux* and *S. corticalis* are common, as confusion could result between them, especially on the island of St. Vincent.”

**10. *Sylophopsis sechellensis*:** two sites (2006: 665, 721). Identification confirmed by Mostafa Sharaf.

*Sylophopsis sechellensis* (formerly *Monomorium sechellense*) is an Old-World ant species that has recently been found for the first time on many West Indian islands and in Florida (Wetterer & Sharaf, 2017; Wetterer, 2020b).

**11. *Trichomyrmex destructor*:** four sites (2004: 142, 163–164; 2006: 664, 686).

The destroyer ant, *Trichomyrmex destructor* (formerly *Monomorium destructor*), is a widespread Old-World pest in many tropical and subtropical areas, where it is notorious for chewing through the insulation of electrical wires, living in and destroying electrical equipment, and attacking people (Wetterer, 2009).

#### Re-identification

*Odontomachus bauri* (misidentified as *O. haematodus*).

In the past, the name *Odontomachus haematodus* was applied to what we now know to be several distinct species, including *Odontomachus bauri* (Brown, 1976). Non-native populations of *O. haematodus* have been found in Florida. *Odontomachus bauri* is widespread in the West Indies (Wetterer et al., 2016, 2019).

## Discussion

Although the islands of St. Vincent, Grenada, and Barbados are not far apart geographically and have similar climates, they differ in many ways, including geologic history, topography, geographic isolation, and human impacts (Table 1). The present study indicates that, compared with Grenada and Barbados, St. Vincent has more Neotropical ant species and fewer Old-World ant species records (Table 1). These differences may be due to several possible factors. The higher Neotropical ant species richness may be related to more mountainous topography and more remaining forest cover (Table 1). Some Neotropical ant species that Smith collected on St. Vincent in 1889–1890, however, may now be extinct on the island. Fewer exotic Old-World ant species on St. Vincent may be related to lower historical and on-going human impacts as indicated by lower human population density (Table 1). In addition, St. Vincent may have a lower rate of exotic ant arrivals, in part related to lower international tourism levels (Table 1).

Forel (1897) wrote that the ant faunas of St. Vincent and Grenada were almost identical. In fact, Wetterer et al. (2019) found that 54 of the 65 Neotropical ant species known from Grenada are also known from St. Vincent, including all 35 Neotropical ant species that Wetterer et al. (2019) collected at six or more sites in Grenada.

**Table 1.** Ant species richness known from St. Vincent and the neighboring islands of Barbados (Wetterer et al., 2016) and Grenada (Wetterer et al., 2019). Elev. = maximum elevation. Neo = Neotropical species, OW = Old World species. Forest cover, population density, and tourism data from United Nations (2020).

	Area (km <sup>2</sup> )	Elev. (m)	% forest	pop/ km <sup>2</sup>	tourists/ year	# known ant species		
						Neo	OW	Total
St. Vincent	381	1234	69.2	285	80k	72	15	87
Grenada	344	840	50.0	331	185k	65	17	82
Barbados	462	336	14.7	668	680k	46	24	70

I have conducted ant surveys on more than 30 major islands of the Eastern Caribbean. As I write up the results from more islands, I expect to be able to evaluate larger scale trends in the biogeography of West Indian ants.

## Acknowledgments

I thank the St. Vincent and the Grenadines Forestry Department for logistic help; M. Wetterer for comments on this manuscript; S. Cover, D. Lubertazzi, J. Pacheco, W. Mackay, and M. Sharaf for ant identifications; the National Science Foundation (DEB-0515648) and Florida Atlantic University for financial support.

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