

**PROCEEDINGS
OF THE
FOURTH SYMPOSIUM
ON THE
NATURAL HISTORY OF THE BAHAMAS**

**Edited by
W. Hardy Eshbaugh**

**Conference Organizer
Donald T. Gerace**

**Bahamian Field Station, Ltd.
San Salvador, Bahamas
1992**

c Copyright 1992 by Bahamian Field Station, Ltd.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in written form.

Printed in USA by Don Heuer

ISBN 0-935909-41-9

WASPS OF THE BAHAMAS
(HYMENOPTERA: SCOLIIDAE, TIPHIIDAE, POMPILIDAE,
VESPIDAE, SPHECIDAE)

Nancy B. Elliott
Department of Biology
Siena College
Loudonville, NY 12211

ABSTRACT

Because of the geologic history of the Bahama Islands, faunal studies can produce important biogeographical information. However, with few exceptions the wasps of the Bahama Islands have not been well-studied. Records from museum collections and the literature reveal a mean of 7.24 wasps recorded from 17 of the major islands. Since 1975, 30 species have been collected from San Salvador. This includes three species of the family Tiphiidae and two of Scoliidae; the females of both these species oviposit on paralyzed beetle larvae in their burrows. There are eight species of Vespidae, all of them predators on Lepidoptera. There are three species of Pompilidae and 14 Sphecidae. Pompilids all prey upon spiders and the sphecids are most variable in their prey choices. Among the sphecids on San Salvador, seven prey upon Orthoptera, three on Diptera, two on Coleoptera, one on spiders and there is one scavenger.

By comparison, few studies of wasps have been conducted on other Bahamian islands. A total of 22 species were reported from the Biminis (Krombein, 1953); twelve of these also occur on San Salvador. During a visit to Long Island in 1990, I collected eighteen species, sixteen of which also occur on San Salvador. Other islands with substantial numbers of records include New Providence (13 species) and Eleuthera (11). There are no known records for Great Abaco or Great Exuma.

INTRODUCTION

The Bahama Islands lend themselves particularly well to tests of biogeographic hypotheses. Many of the islands lie on one of two shallow platforms, the Great and Little Bahama Banks.

Islands of the Little Bahama Bank in the northern Bahamas include Grand Bahama and Great and Little Abaco. The Great Bahama Bank unites many islands in the central Bahamas including the Biminis, New Providence, Andros, Eleuthera, Long Island, Cat Island and the Exumas. While islands on each of the banks were connected to each other in the Pleistocene, each bank remained separate from the other (Correll, 1979). Furthermore a Pleistocene connection between Cuba and the Great Bahama Bank may have been a major migration route for the Bahamian biota (Correll and Correll, 1983). A third group of islands in the southeastern Bahamas have always been entirely isolated; these include San Salvador, Great Inagua and Mayaguana. This geologic history leads to several testable hypotheses concerning the Bahamian fauna. We would predict more similarities in faunas on each of the banks than between them, and differences in faunas with more endemic species on the isolated islands to the southeast. Information on the Bahamian herpetofauna support these predictions (Schwartz and Thomas, 1975), but further tests on insect groups are desirable as well. The wasps as a group are well suited to such a study.

Wasps have several important ecological roles. Females usually prey on other insects, which are stored in the nest as food for the developing larvae (Evans and West-Eberhard, 1970). Adults of both sexes feed on pollen and nectar, and their role in plant pollination is reported to be more important in tropical than temperate environments (Heithaus, 1979). Many of the smaller species fly weakly and thus disperse poorly. The ground-nesting Sphecidae and Pompilidae are often restricted in habitat to areas of suitably friable soil, and this relative isolation has led to differentiation into identifiable island subspecies (eg. Krombein, 1953). For this reason studies of wasp populations in the

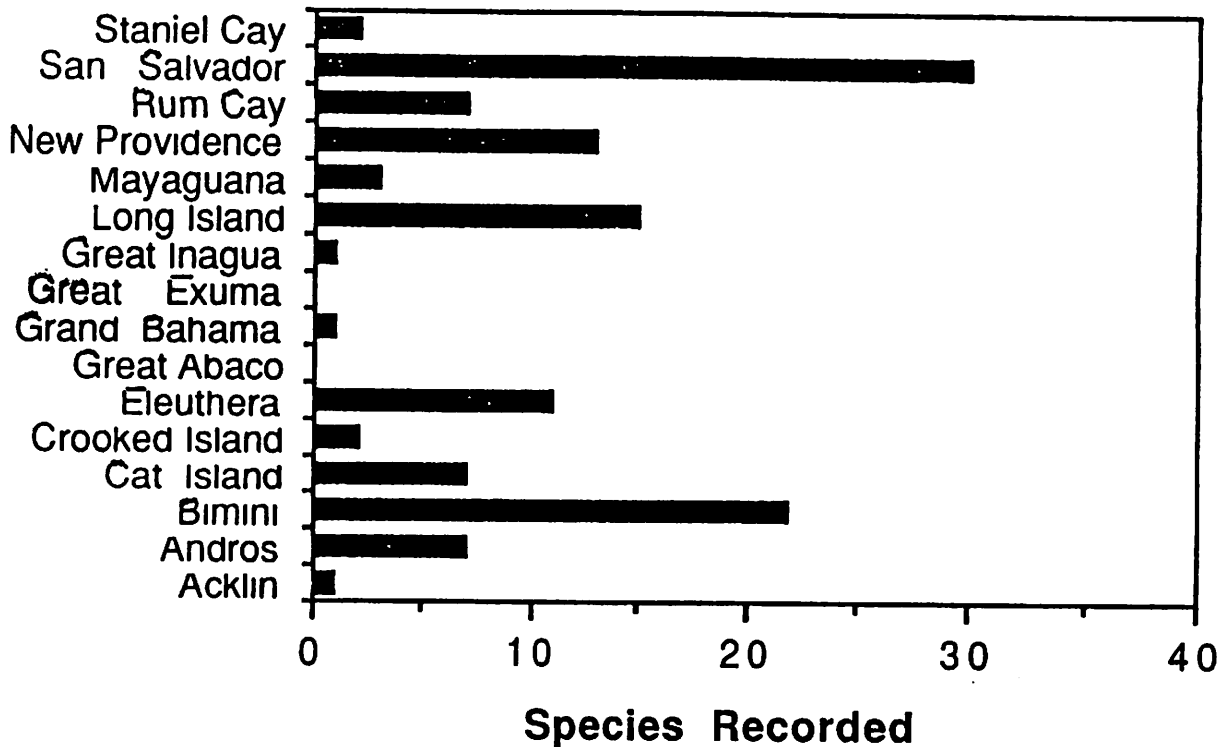


Figure 1. Island records for wasps from the Bahamas. These records are the result of a search of the literature and observations of museum collections.

Bahamas may be useful in resolving biogeographic questions regarding the Bahama Banks.

Although several authors (eg. Menke, 1986) have stressed the need for studies of wasps in the Bahama Islands, the wasp faunas of many of the islands are poorly known (Fig. 1). Previous studies have been restricted to a few of the islands where there were field stations, principally Bimini (Krombein, 1953) and San Salvador (Elliott *et al.*, 1979), although occasional Bahamian records have been included in taxonomic revisions (Bequaert, 1948; Bequaert and Salt, 1931; Bradley, 1928; Krombein, 1942; Menke, 1986; Pate, 1947; Pulawski, 1988).

Krombein (1953) reported on the bees and wasps collected in the Biminis. Among the 22 species of wasps listed were two new species and four new subspecies. Since Elliott *et al.* (1979) reported 23 species of wasps from San Salvador, seven additional species have been added to the list. In July, 1990, W. Elliott and I collected wasps on Long Island, surveying the northern portion of the island as far south as Salt Pond. We collected a total of eighteen species of wasps from the island, sixteen of which also occur on San Salvador.

In this paper, in preparation for a more extensive survey of Bahamian wasps, I shall review the

records of wasps from my own collections on San Salvador and compare the list for San Salvador with Krombein's (1953) list from Bimini and our records from the collections on Long Island. Information from a review of museum specimens is also included.

RESULTS AND DISCUSSION

Family: Tiphidae

All the tiphids from the Bahamas belong to the genus *Myzinum*, the females of which are thought to oviposit on larval scarab beetles (Krombein *et al.*, 1979). A number of subspecies of *M. apicalis* have been described from the various islands (Krombein, 1942; 1953). These include *M. apicalis brevis* from New Providence and Rum Cay, *M. a. cazieri* from Bimini, and *M. a. eleuthera* from Eleuthera. The specimens of *M. apicalis* from San Salvador are not assignable to any of these subspecies (Menke, pers. comm). Two other species of *Myzinum* from San Salvador, *M. ephippium* and *M. albopicta*, have not been found on Bimini or Long Island (Table 1.). However, Krombein (1953) did report *M. ephippium* from Grand Bahama and Mayaguana.

Table I. *Tiphidae and Scoliidae of Bimini, Long Island and San Salvador*

ISLAND	Bimini	Long Island	San Salvador
TIPHIDAE			
<i>Myzinum albopicta</i> Cresson			X
<i>M. apicalis cazieri</i> Krombein	X		
<i>M. apicalis</i> Cresson (no subsp. ident).			X
<i>M. ephippium bahamense</i> Krombein			X
SCOLIIDAE			
<i>Campsomeris atrata</i> (F.)			X
<i>C. trifasciata nassauensis</i> Bradley	X	X	X

Family: Scoliidae

Members of this family also parasitize the larvae of scarab beetles (Krombein et al., 1979). The most widespread scoliid in the Bahamas is *Campsomeris trifasciata nassauensis*. The Bahamian subspecies was differentiated from the Greater Antillean form of *C. trifasciata* by Bradley (1928). The subspecies has also been reported from Andros (Elliott et al., 1979) as well as from the three islands under consideration (Table 1). The floral-feeding activities of this species on San Salvador were studied by Elliott (in press). The only Bahamian records for *Campsomeris atrata* are from San Salvador.

Family: Vespidae

There are three species of social vespids on San Salvador. *Polistes exclamans* is widely distributed throughout the Bahamas (Table 2). Bequaert and Salt (1931) described several Bahamian subspecies including *P. e. bahamensis* from Andros, *P. e. bilineolatus* from Bimini, Eleuthera and New Providence, and *P. e. picturatus*, which was the only wasp listed from San Salvador by Krombein (1953). This subspecies also occurs on Acklin, Mayaguana, Rum Cay, Crooked, Cat and Long Islands. The San Salvador specimens differ

somewhat from Bequaert and Salt's (1931) description (Elliott et al., 1979). A larger species, *Polistes major*, occurs on Long Island and San Salvador; Krombein (1953) reported it from Eleuthera, but not from Bimini. A smaller social species, *Mischocyttarus cubensis*, occurs on the three islands under comparison as well as Eleuthera (Elliott et al., 1979) and New Providence (Krombein, 1953). All the social species listed prey on caterpillars which are dismembered and fed to the larvae (Krombein et al., 1979).

Menke (1986) described a new species of *Pachodynerus* from Mayaguana and reviewed previous information on Bahamian specimens of the genus. He determined that the subspecies *P. scrupeus bahamensis* (Bequaert and Salt, 1931) should actually be *P. cubensis bahamensis*. Menke (1986) reported both *P. scrupeus* and *P. c. bahamensis* from San Salvador and Bimini, and we collected both from Long Island as well. *Pachodynerus nasidens*, which has been collected on San Salvador had previously only been reported from New Providence in the Bahamas (Bequaert, 1948).

Both *Zethus bahamensis* and *Zeta abdominale* occur on San Salvador and Long Island, but not Bimini. *Zethus bahamensis* was originally described from a specimen from New Providence (Bequaert and Salt, 1931), and is also reported from Cat Island (Elliott et al., 1979).

Table II *Vespidae of Bimini, Long Island and San Salvador.*

ISLAND	Bimini	Long Island	San Salvador
<i>Polistes exclamans bilineolatus</i> Bequaert & Salt	X		
<i>P. e. picturatus</i> Bequaert & Salt		X	X
<i>P. major</i> Palisot de Beauvois		X	X
<i>Mischocyttarus cubensis</i> Saussure	X	X	X
<i>Pachodynerus cubensis bahamensis</i> Bequaert & Salt	X	X	X
<i>P. nasidens</i> (Latreille)			X
<i>P. scrupeus</i> (Zavattari)	X	X	X
<i>Zeta abdominale</i> (Drury)		X	X
<i>Zethus bahamensis</i> Bequaert & Salt		X	X

ISLAND	Bimini	Long Island	San Salvador
<i>Anoplius fulgidus</i> (Cresson)	X		X
<i>A. insignis bahamas</i> Krombein	X	X	X
<i>A. scintillatus</i> Krombein	X		
<i>Epsyron conterminus posterus</i> (Fox)			X
<i>Pepsis marginata</i> Beauvois	X		
<i>P. saphyrus</i> Beauvois	X		
<i>Pepsis</i> sp.		X	

Table III *Pompilidae of Bimini, Long Island and San Salvador.*

Family: Pompilidae

The Pompilidae are commonly called spider wasps because all prey upon spiders which are captured and cached while the nest is prepared. Only three species are listed from San Salvador (Table 3). Krombein (1953) described a new species and subspecies of *Anoplius* from Bimini, and one of these, (*Anoplius insignis bahamas*), is the only pompilid common to the three islands. While large tarantula hawks (*Pepsis* spp.) occur on both Bimini and Long Island, they are not found on San Salvador.

Family: Sphecidae

Of the families discussed, this one represents the greatest diversity of behaviors and prey use. There are fourteen species of sphecids on San Salvador; on Long Island we collected eight species, all but one of which also occur on San Salvador. Krombein listed eleven sphecids from Bimini; seven of them also occur on San Salvador.

Two species of *Cerceris* have been collected on San Salvador; there are no records for this genus from other Bahamian islands. However, since *C. cubensis* was first described from Cuba (Bohart and Menke, 1976), we can infer its occurrence on other islands to the west of San Salvador.

Table IV *Sphecidae of Bimini, Long Island and San Salvador.*

ISLAND	Bimini	Long Island	San Salvador
<i>C. wallingensis</i> Elliott & Salbert			X
<i>Cerceris cubensis</i> Cresson			X
<i>Ectemnius auriceps</i> Cresson			X
<i>Epibembix insularis</i> (Dahlbom)	X		
<i>Liris antilles</i> Krombein	X		X
<i>L. argentata</i> Beauvois	X		X
<i>Microbembix monodonta</i> (Say)	X		
<i>Microbembix</i> sp.		X	X
<i>Oxybelus analis bimini</i> Krombein	X		
<i>Oxybelus</i> sp.		X	X
<i>Prionyx thomae</i> (F.)		X	X
<i>Sceliphron jamaicense</i> (F.)	X	X	X
<i>Sphecius hogardii bahamas</i> Krombein	X	X	
<i>Sphex jamaicensis</i> (Drury)	X	X	X
<i>Stictia signata</i> (L.)	X	X	X
<i>Tachysphex alayoi</i> Pulawski		X	X
<i>Tachysphex similis</i> Rohwer	X		X
<i>Tachytes distinctus bimini</i> Krombein	X		
<i>Tachytes tricinctus</i> (F.)			X

ISLAND	Bimini	Long Island	San Salvador
Family: Tiphidae	1	0	3
Family: Scoliidae	1	1	2
Family: Vespidae	4	7	8
Family: Pompilidae	5	2	3
Family: Sphecidae	11	8	14
Total Wasp Records	22	18	30
% species in common with San Salvador	54%	89%	--

Table V. *Summary of collections from Bimini, Long Island and San Salvador.*

This small species preys upon beetles of the family Chrysomelidae (Elliott *et al.*, 1981). *Cerceris watlingensis* was described from San Salvador (Elliott *et al.*, 1979), and may be endemic to the island, although further collecting on nearby islands is necessary before this can be stated unequivocally. Females of this species make extensive nests and store weevils as prey; the most common prey is a small white species of *Artipus*. (Salbert and Elliott, 1979).

Seven of the San Salvador sphecids prey on Orthoptera. Both species of *Liris* prey upon crickets as does *Sphex jamaicensis*. Some prey taken by the latter species on San Salvador have been identified as *Laurepa* sp. (T. J. Walker, pers. comm.; T. L. Shlotzhauer unpub). All three of these species occur on both Bimini and San Salvador; *Sphex jamaicensis* occurs on Long Island as well. *Tachysphex alayoi* preys upon roaches; prey from San Salvador was identified as *Symploce* sp. nr. *munda* Gurney (Elliott *et al.*, 1979). Originally described from Cuba, Bahamian specimens of *T. alayoi* have been reported from Eleuthera and Great Sale Cay (Pulawski, 1988), and we did collect it on Long Island as well. *Tachysphex similis* is a widely distributed North American species, also recorded from Eleuthera (Pulawski, 1988) and Bimini (Krombein, 1953). The prey are small nymphal short-horned grasshoppers (Family: Acrididae). *Tachytes tricinctus* also preys on acridid grasshoppers, usually adults or older nymphs; prey records for San Salvador are for *Dellia* sp. and *Ophulella pelidna pelidna* (Elliott and Salbert, 1981). *Prionyx thomae* also preys on Acrididae (pers. observation).

Three species prey upon Diptera. *Ectemnius* species are reported to prey upon flies (Krombein *et al.*, 1979) although we have no prey records for *Ectemnius auriceps* on San Salvador. *Stictia signata* preys upon larger flies in the families Syrphidae, Muscidae, Sarcophagidae and Calliphoridae (Elliott *et al.*, 1979); *Oxybelus* prey on smaller flies (pers. observation). *S. signata* is a widely distributed wasp occurring from Mexico through Central and South America and in the Caribbean. In the Bahamas it occurs on all three of the islands under comparison as well as Andros, Cat Island, Crooked Island, and New Providence (Elliott *et al.*, 1979). The m u d - d a u b e r *Sceliphron jamaicense* occurs on all three islands.

Prey are spiders, although we have no prey records from San Salvador. *Microbembix monodonta* has been reported from Bimini (Krombein, 1953) and from Staniel Cay where a second species, *M. cubana* also occurs (Toft, 1987). Menke (pers. comm.) has been hesitant to place a species determination on our specimens because of the need for a revision of the West Indian species of this genus. *Microbembix* are scavengers on dead insect parts; they nested on sandy beaches on both San Salvador and Long Island. The cicada killer, *Sphecius hogardii bahamas* occurs on both Bimini and Long Island (Krombein, 1953), but not San Salvador, despite the presence of suitable prey (Elliott, 1983).

CONCLUSIONS

There are more similarities in wasp fauna between San Salvador and Long Island, which are only about 50 miles apart, than there are between Bimini and the other two islands (Table 5). Long Island is a very large island, and we have not surveyed it entirely; furthermore time should be spent on Long Island at other seasons of the year for more meaningful comparisons between the islands. Long Island is at the edge of the Great Bahama Bank; the island of Rum Cay which lies between Long Island and San Salvador, may serve as a steppingstone between the two. There is some evidence for this from distributions of amphibians and reptiles (Schwartz and Thomas, 1975). Further collections on Rum Cay are clearly necessary. There is need for further study of wasps in the Bahamas, particularly on islands of the great Bahama Bank lying nearer Cuba, and the islands of the Little Bahama Bank which lies near Florida before we can make unequivocal statements about the origins and geographic relationships of the Bahamian wasp fauna.

ACKNOWLEDGMENT

I thank Dr. Donald Gerace, Executive Director of the Bahamian Field Station, and Mrs. Kathy Gerace for all their assistance during my years of study on San Salvador. The Station provided room and board to me and to W. Elliott during a number of collecting trips to the island. Additional financial assistance for collecting trips came

from Siena College Faculty Research Grants. I thank the Bahamian Ministry of Agriculture for collecting permits. Dr. A. S. Menke, U. S. National Museum, identified most of the Bahamian wasp specimens. Dr. W. J. Pulawski, California Academy of Sciences, verified the identification of *Tachysphex similis*. Dr. F. E. Kurczewski, SUNY College of Environmental Science and Forestry identified the pompilids. Dr. T. J. Walker, Florida Department of Agriculture, identified the prey of *Sphex jamaicensis*. The late A. B. Gurney, U. S. National Museum, identified grasshoppers and roaches used as prey. I thank T. L. Shlotzhauer for her notes on *Sphex jamaicensis* and William M. Elliott for collecting assistance.

LITERATURE CITED

- Bequaert, J. C. 1948. The genus *Pachodynerus* (Hymenoptera: Vespidae) in the Antilles. *Psyche* 55:105-112.
- Becquaert, J. C. and G. Salt. 1931. New West Indian Diptera. *Ann. Entomol. Soc. Amer.* 24:765-797.
- Bohart, R. M. and A. S. Menke. 1976. *Sphexid Wasps of the World, A Generic Revision*. Univ. of Calif. Press, Berkeley and Los Angeles. x + 695 pp.
- Brad, J. C. 1928. The species of *Campsomeris* of the plumipes group inhabiting the United States, the Greater Antilles and the Bahamas Islands. *Proc. Acad. of Sci. Philadelphia* 80: 313-338.
- Correll, D. S. 1979. The Bahamian Archipelago and its plant communities. *Taxon* 28: 35-40.
- Correll, D. S. and H. B. Correll. 1983. *Flora of the Bahamas Archipelago*. J. Cramer, Vaduz, Germany. Pp. 1692.
- Elliott, N. B. 1983. *Field Guide to the Insects of San Salvador Island, Bahamas*. College Center of the Finger Lakes Bahamian Field Station Publication in Biology #9.
- Elliott, N. B. 1990. Flower feeding activities of *Campsomeris trifasciata nassauensis* Bradley (Hymenoptera: Scoliidae). *Proceedings Third Symposium on Botany of the Bahamas*, Pp. 1-6
- Elliott, N. B., W. M. Elliott, and P. Salbert. 1981. Nesting behavior of *Cerceris zonata* (Hymenoptera: Philanthidae). *Ann. Entomol. Soc. Amer.* 74: 127-129.
- Elliott, N. B., F. E. Kurczewski, S. Claflin and P. Salbert. 1979. Preliminary annotated list of wasps of San Salvador, Bahamas, with a new *Cerceris* (Hymenoptera: Tiphidae, Scoliidae, Vespidae, Pompilidae, Sphecidae). *Proc. Entomol. Soc. Wash.* 81: 352-65.
- Elliott, N. B. and P. Salbert. 1981. Observations on the nesting behavior of *Tachytes tricinctus* on San Salvador Island, Bahamas (Hymenoptera: Sphecidae, Larrinae). *J. N. Y. Entomol. Soc.* 88: 170-173.
- Evans, H. E. and M. J. West-Eberhard. 1970. *The Wasps*. Univ. of Michigan Press, Ann Arbor. Pp. 265.
- Heithaus, E. R. 1979. Community structure of neotropical flower visiting bees and wasps: diversity and phenology. *Ecology* 60: 190-202.
- Krombein, K. V. 1942. Studies in the Tiphidae (Hymenoptera, Aculeata). Part V. A revision of the West Indian Myzininae. *Rev. Entomol.* 13: 308-353.
- Krombein, K. V. 1953. The wasps and bees of the Bimini Island Group, Bahamas, British West Indies. *Amer. Mus. Nov.* 1633: 1-29.
- Krombein, K. V., P. D. Hurd, Jr., D. R. Smith and B. D. Burks. 1979. *Catalog of Hymenoptera in America North of Mexico*. Vol 2. Smithsonian Institution Press, Washington, D.C.

- Menke, A. S. 1986. A new *Pachodynerus* from Mayaguana Island, and a key to West Indian species of the genus (Hymenoptera: Vespidae, Eumeninae). Proc. Entomol. Soc. Wash. 88: 650-665.
- Pate, V. S. L. 1947. The pemphilidine wasps of the Caribbees (Hymenoptera: Sphecidae). Trans. Amer. Entomol. Soc. 73: 1-33.
- Salbert, P. and N. B. Elliott. 1979. Observations on the nesting behavior of *Cerceris watlingensis* (Hymenoptera: Sphecidae, Philanthinae). Ann. Entomol. Soc. Amer. 72: 951-55.
- Schwartz, A. and R. Thomas. 1975. *A Checklist of West Indian Amphibians and Reptiles*. Carnegie Mus. Nat. Hist., Pittsburgh, PA. Pp. 216.
- Toft, C. A. 1987. Activity budgets, habitat use, and body size in two coexisting species of sand wasps (*Microbembix*: Sphecidae, Hymenoptera) Ecol. Entomol. 12: 427-438.