

AMERICAN MUSEUM NOVITATES

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CITY OF NEW YORK MAY 13, 1952 NUMBER 1565

INSECT COLLECTING IN THE BIMINI ISLAND GROUP, BAHAMA ISLANDS

BY PATRICIA VAURIE¹

A preliminary sampling of the insect fauna of the Bimini Island group in the Bahamas was made shortly after the erection of the Lerner Marine Laboratory of the American Museum of Natural History on North Bimini in 1947, when Dr. James A. Oliver and Dr. Charles M. Breder, Jr., made a small collection. In 1950 Drs. Mont A. Cazier and Frederick H. Rindge of the American Museum began a more intensive survey by collecting throughout the group during the month of June, and in 1951, Drs. Cazier and Willis J. Gertsch, followed by Dr. and Mrs. Charles Vaurie, collected from May through August. The present paper contains an introductory report of the insects taken, with special emphasis on Coleoptera, an account of the collecting methods employed, and a description of the types of habitats encountered in the Bimini group, some of which are probably more or less duplicated in the other islands of the Bahamas. It is expected in the near future that the field of this survey will be enlarged to include some of the larger and probably more representative of the Bahama Islands. Taxonomic studies on a number of groups are in progress, and it is to be hoped that this report will stimulate specialists in other groups to a further interest in Bahama Island fauna.

During the four months of 1951, 109,718 specimens of Insecta were collected; in addition, 27,839 Arachnida (Scorpiones, Solpugida, Pseudoscorpiones, Opiliones, Acari, and Araneae) and 125 Chilopoda were taken. The Insecta include

¹ Assistant, Department of Insects and Spiders, the American Museum of Natural History.

Protura	15
Aptera	3 est.
Collembola	75,000 est.
Orthoptera	400
Dermaptera	3
Isoptera	200
Embioptera	75
Corrodentia	12
Odonata	150
Thysanoptera	1,000
Hemiptera	5,000
Homoptera	200
Neuroptera	300
Lepidoptera	1,000
Coleoptera	24,000
Hymenoptera	1,025
Diptera	1,200

A list of the 48 families of Coleoptera represented in the Biminis is given in table 1 near the end of this paper; 26 of these families have not before been reported from any of the Bahamas. The general list of Bahaman species of beetles has been doubled by the collections made in the tiny islands of the Bimini group, which shows how little collecting has been done heretofore in the Bahamas as a whole.

ACKNOWLEDGMENTS

Gratitude is here expressed to Dr. Charles M. Breder, Jr., Chairman and Curator, Department of Fishes and Aquatic Biology of the American Museum of Natural History, and to Mr. and Mrs. Michael J. Lerner, for their hospitality and for the excellent facilities afforded us, and to the laboratory staff who were always willing and helpful. I wish also to thank Dr. M. A. Cazier for a critical reading of the manuscript and for aid in the identification of some species. The photographs were taken by Dr. Charles Vaurie.

LITERATURE ON THE BAHAMA INSECT FAUNA

Only mosquitoes, and one species of butterfly (Clench, 1942b) have ever been reported, so far as I know, from the Biminis prior to 1947. A few other insects have been recorded, however, from the other Bahama Islands such as Eleuthera, Abaco, Long, New Providence, and Andros. Most collecting has been concentrated on the islands of the Greater or Lesser Antilles which

are, of course, richer and more varied in their flora and fauna than the low-lying, somewhat barren Bahamas.

It is therefore not surprising that references in the literature to species occurring in the Bahamas are rather limited. In two early general works on the Bahamas, Nutting's report (1895) on the Bahaman expedition of the University of Iowa and "The Bahama Islands" (1905) edited by G. B. Shattuck, a few insects are discussed. Only mosquitoes are treated in the latter book, but in the former H. F. Wickham names a dozen or more insects, mostly Coleoptera, from Spanish Wells on Eleuthera and from Egg Island, near Eleuthera. A few of the species he mentions were also taken by us in the Biminis. Other early general books on the Bahamas by Northrop, Agassiz, etc., contain no references to insects.

In Coleoptera there are a few taxonomic papers (Cazier's papers, 1951, 1952, on the Bahaman buprestids and the author's paper on Cleridae, 1952, were based on present material). Fisher (1925) mentions seven species from the Bahamas in his revision of West Indian Buprestidae and one in his revision of the North American Bostrichidae (1950). Leng and Mutchler (1922) recorded four species in their paper on the lycids, lampyrids, and cantharids. The last-named authors made a preliminary check list of West Indian Coleoptera in 1914, followed by a supplement in 1917, and these lists were used by Blackwelder in his recent catalogues (1944-1947) which contain a total of only 98 species of beetles from the Bahama Islands, no mention being made of specific islands.

In other groups, taxonomic papers on Bahaman insects include some on Lepidoptera (Sharpe, 1900; Hampson, 1901; Bates, 1934; Clench, 1941a, 1941b, 1942a, 1942b, 1942c; Comstock, 1944, this last giving a check list of Bahaman Lepidoptera); on Diptera (Johnson, 1908); on Hymenoptera (Wheeler, 1905); and on Arachnida (Banks, 1906; Cambridge, 1901). Curran's paper (1951) on Diptera was based on present material.

BIMINI ISLAND GROUP

Figure 1

The main island of the Bimini group, North Bimini, about 6 miles long by only 400 feet wide on an average, is inhabited by some 1100 people. It is not only too crowded with human beings and houses for good collecting, at least in the southern part,

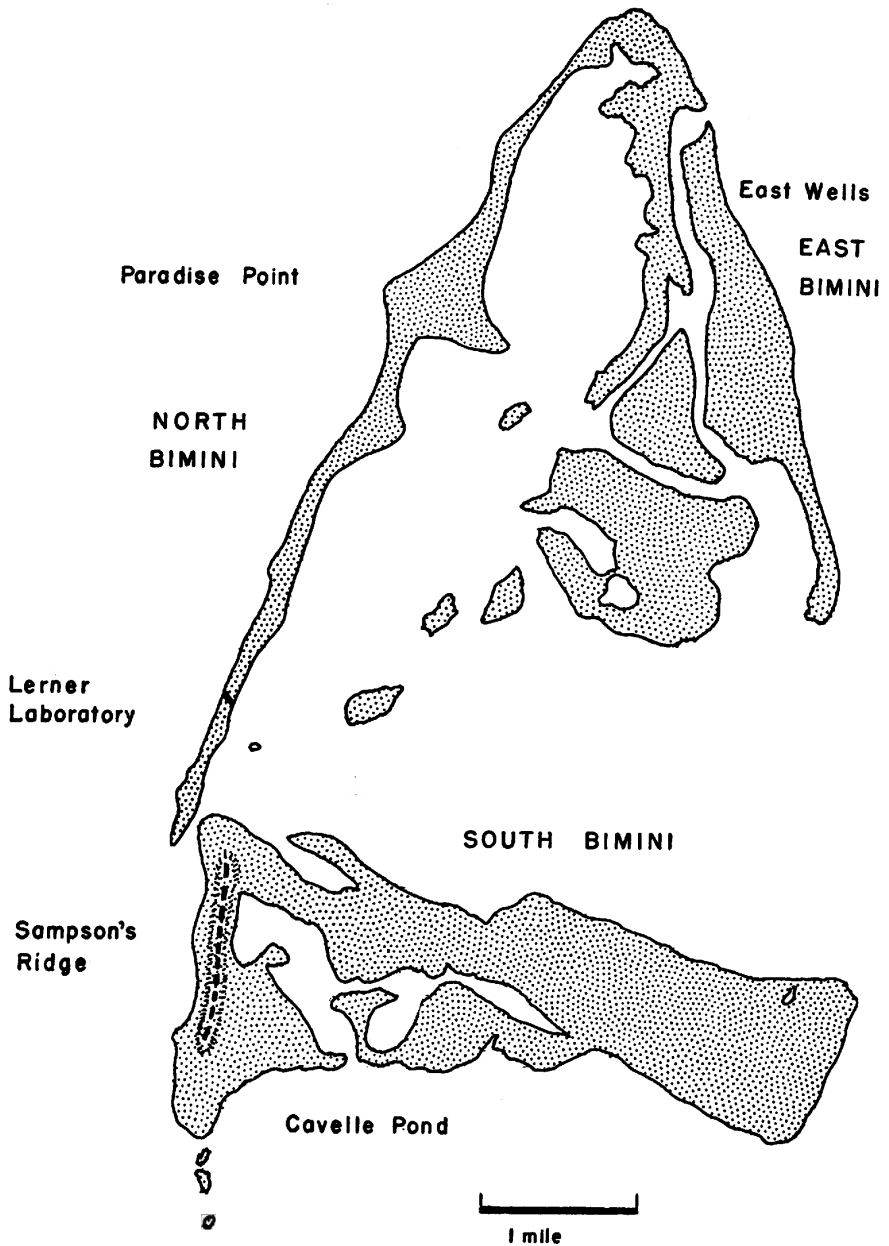


FIG. 1. Bimini island group, Bahamas.

but the original vegetation has been mainly destroyed. East Bimini, although uninhabited, is composed chiefly of expanses of red mangrove and sandy beaches and has few varied habitats.

South Bimini, where almost all the collecting was concentrated, is about 4 by 1 3/4 miles at its greatest width, is uninhabited, is little disturbed, and has the greatest variety of vegetation. The three islands form a kind of isosceles triangle, with North and East Bimini representing the sides and South Bimini the base. North Bimini is separated from the other two islands by narrow channels, but there is a gap of over a mile between South Bimini and the southern end of East Bimini.

The climate in summer is hot and humid, with prevailing trade-wind breezes from the southeast. The rainfall is only about 50 inches a year (Shattuck, 1905), but four-fifths of it falls from May to October, the heaviest precipitation being in August. The rain, however, quickly runs through the porous ground. The vegetation is of the thorn-scrub type (Howard, 1950).

In contrast to some of the islands in the Greater and Lesser Antilles and other islands in the Bahamas, the Biminis lack certain important habitats. There are no hills, the highest land being but 30 feet above sea level. There are low trees and woody vegetation but no stands of large trees; no conifers except a plantation of the imported Australian pine (*Casurina equisetifolia*), a tree generally free from insects; very little cultivated land, in fact scarcely any soil except for a thin layer of humus in a few areas on South Bimini; no standing fresh water at the present time, only some brackish ponds. The only mammals are domestic dogs, cats, pigs, and a few goats, and a very small number of mice, rats, and rabbits. There are few nesting land birds (Vaurie, C., in press). These omissions from the flora and fauna at once rule out the presence of certain kinds of insects and indicate the probable scarcity of others.

Although the insect fauna is thus relatively poor, as might be expected on such small, exposed, and floristically limited islands, it is nevertheless very rich in some respects. There are a great many dead, mutilated, or dying trees and bushes everywhere on South Bimini, the result of storms and hurricanes or invading salt water and spray, and this wealth of dead wood attracts many wood-boring and bark-inhabiting beetles, especially the long-horned beetles (Cerambycidae) which comprised over a quarter of all the Coleoptera taken in 1951. Buprestidae, Ostomidae, Bostrichidae, and Elateridae occur in great numbers, as do beetles found on or under bark, such as the Cucujidae, Colydiidae, Tenebrionidae, Alleculidae, and Curculionidae. Most

of these are nocturnal beetles. Of the other flourishing insects, dragonflies are abundant everywhere and, unfortunately, so are mosquitoes and sandflies, both day and night.

For additional information on the history, geography, economy, and plant life of the islands, Richard A. Howard's excellent paper on the vegetation of the Bimini group (1950) should be consulted. I have used his terms throughout this paper for the types of plant communities and for the common plants.

COLLECTING METHODS

In 1951 we collected for about two and one-half hours each morning and from 7 P.M. to 11 P.M. nearly every night. We soon found that, partly owing to the kind of vegetation which is "of the thorn scrub type. . . low, stunted, broken and gnarled" (Howard, p. 321), and partly owing to the types of insects, daytime beating and indiscriminate sweeping were not very productive. Therefore most of our insects were swept individually into the net when seen, or were stalked and hand picked. Turning over coral rocks or palm debris was also not generally profitable, but an occasional colony of ants was found under rocks. Coleoptera could be found under bark, but since they could be taken more readily at night, we did not usually take time to strip bark during the day. The terminal twigs and small branches of each dead bush or tree, also the tangles of dried twigs lying on the bare ground, were examined minutely for small beetles. True stalking had to be applied to quick-flying beetles like buprestids, which were often found in awkward situations on tree trunks, branches, under branches, or in the crotches. If the branches were small enough, jarring them from the opposing side so that the beetle fell suddenly into the waiting net was usually successful. The leaves of living plants were also examined, and flowering trees or bushes were swept for the flies, bees, and wasps hovering around them. In clearings among palmettos and tangled underbrush, flying insects were watched for and swept as they passed by.

Time was occasionally taken from this type of collecting to be devoted to sifting for spiders and small beetles. In May, Gertsch, who spent a good deal of time sifting, found most of his spiders by this method. Berlese funnels at the laboratory were also used for small insects, being filled every other day or so with bags of leaf and twig debris, also drift from the beach, mostly Sargasso weed. Large numbers of Acari, Collembola, and ptiliid

beetles that would not otherwise have been collected were taken in this manner.

Another passive collecting means employed was a series of three large breeding cages at the laboratory which Cazier filled in May with sticks and branches showing evidence of oviposition. During the summer many beetles emerged from the dead wood, which was examined once or twice a day, such as cerambycids (*Neoclytus bahamicus*, *Cerasphorus cinctum ochraceum*, *Cylindera flava*, and *Leptostylus argentatus*), bostrichids (*Amphicerus cornutus*, *Melalgus gonagra*, *Tetrapriocera longicornis*, *Xylomeira torquata*), a few buprestids of the small genus *Xenorhipis*, and some anthribids.

As in many rather dry areas, night collecting was far superior to daytime collecting. We each had five-celled head lamps, or jack lights, and two Coleman lanterns. The sheets and lanterns were worked periodically during the night, but the main work was inspecting with the head lamps the trees, dead brush, dead twigs on the ground, all dead palm fronds on the ground or still on the tree, the leaves of plants, the flowers of the palmettos when in bloom, the holes and crevices in tree trunks, and the ends of twigs.

COLLECTING AREAS ON NORTH BIMINI

In 1951, collections were made on North Bimini only on the few days or nights when for reasons of bad weather or lack of transportation it was impossible to get to South Bimini. The same insects, as well as many additional species, could be taken in greater quantity on the latter island.

Very numerous on the bushes and hedges on the laboratory grounds, day or night, was a small, white-scaled curculionid (*Artipus* sp. near *floridanus*), which was common also on the other islands and was taken on many different plants. At the laboratory lights at night and on the screens of the lighted windows the principal insects were beetles of the family Oedemeridae (*Oxaxis*, *Alloxaxis* spp.), and Alleculidae (*Hymenorus* sp., *Allecula*). These were at times so thick at the more sheltered lights that the white wall on which they rested could not be seen. Other insects at night included a number of species of Elateridae, Scarabaeidae, and small Carabidae in Coleoptera; small green Pentatomidae (*Thyanta*) in Hemiptera; a few Lepidoptera, including an occasional large Sphingidae; Neuroptera; Odonata;

and, in August, many Cicadidae. The second Bimini specimen of the buprestid *Melanophila notata* was taken, strangely enough, inside the residence, and the third in a spider web on the porch. Swift-moving, flat spiders (*Selenops* sp.) hunted on the trunks of the coconut palms in the yard.

Walking north from the laboratory on the eastern or bay side, we found *Cicindela marginata* and *C. trifasciata*, the only tiger beetles in the Biminis, running on the narrow strip of sand at low tide. *C. marginata* is more numerous here as in the other islands. A large sandy area inland behind the wide belt of white mangrove (*Laguncularia racemosa*) that skirts the shore also has tiger beetles and numerous small, brown Lepidoptera (*Brephidium pseudofea*). At the end of the native settlement of Bailey Town in a bushy, grassy area, we took the coccinellid *Cycloneda sanguinea* and various Chrysomelidae by sweeping, and we stalked the large red robber fly, *Proctacanthus lernerii*. The latter usually makes its presence known by a sharp buzz. It flies fast but not far and we pursued it from bush to twig until netted, or waited until it returned to the place where we first saw it. Syrphidae and Orthoptera are also present among the bushes. Still going northward we passed through a large grove of Australian pine and young coconuts before reaching the uniola strand community north of Paradise Point. Here on some dead twigs we found a few specimens of the buprestid *Paratyndaris suturalis* which occurs more commonly on South Bimini. Near a brackish pond at the southern end of North Bimini, Gertsch in May collected the only specimen of the curculionid *Calendra venatus vestita*, a large billbug known from New Providence and other islands, as well as from the southeastern United States.

COLLECTING AREAS ON EAST BIMINI

Since East Bimini cannot be reached except by an hour's boat ride, it was visited only a few times and only at its northern end near East Wells. The entire western half of this long spit of land is a maze of red mangrove (*Rhizophora mangle*). At the northeastern tip (fig. 2) is a strip of sand shrub inhabited by Asilidae and Syrphidae, many Odonata, and Cicindelidae on its edges by the shore. Penetrating the small trees and shrubs behind the coastal vegetation we found clearings so filled with the holes of the giant land crabs that the ground often broke through under our feet. Some inch-long Tabanidae rested on the trunks

of the shrubs, and Orthoptera flew at our approach from the tall grasses into the surrounding bushes.

COLLECTING AREAS ON SOUTH BIMINI

The numbers and variety of insects collected on South Bimini would no doubt have been much less had it not been for the work of a Mr. Rolle who had partially cleared and burnt an area on which he intended to build a house and raise a few crops and chickens (fig. 3). His land was situated on what is known locally



FIG. 2. East Bimini, northwestern end.

as Sampson's Ridge, an elevated limestone ridge near the center of the western coast covered with woody, black-land vegetation, including some taller trees (about 20 to 25 feet). This man-made enclosure of perhaps 70 by 100 feet was a wonderful windfall for us and caused a notable concentration of insects at that spot. It was cut into the dense, often impenetrable, woody scrub growth just behind the beach vegetation, giving access to the heart of the ridge and to a broad savanna-like expanse beyond. The original clearing had been made about the first of April, and by

the middle of May Cazier had found collecting excellent, especially at night. Additional chopping and firing of trees and brush around the yard went on sporadically throughout the summer, resulting in a continual supply of beetles, no matter how often we hunted for them. The rows of burnt stumps, the singed, felled, or broken trees, and the piles of dead limbs and twigs made



FIG. 3. Rolle's yard on Sampson's ridge; *Spondias purpurea* in center background.

an ideal rendezvous for the insects and us. The insects taken here are discussed below.

A typical morning's collecting in June, July, or August, 1951, began with our stepping from the outboard motor boat on to the sandy shore of South Bimini. This northwestern part of the island is what Howard calls a "sand *Coccothrinax*-shrub community" (1950, p. 332), an open area of silver palms and low shrubby plants. The asilid *Proctacanthus lernerii* and other flies (Syrphi-

dae, Bombyliidae), as well as large grasshoppers, were taken among the shrubs. On the bare sandy half-mile stretch of a projected but never finished air strip we tried with varying success to net some of the numerous, swiftly flying *Bembex* wasps which hovered close to the sand, and took a few *Cicindela marginata*. In places the shrubs were intertwined with a beautiful, purple-flowered morning-glory vine from which occasional Chrysomelidae (*Chelymorpha cassidea geniculata*) and tiny flies (Trupaniidae) were swept. After a short time in this area we turned eastward to walk along the row of shrubbery and low trees behind which extends the mangrove area bordering the large inland salt-water bay called Cavelle Pond. On the sparse little leaves of the black mangrove or blackwood bush (*Avicennia nitida*) and other trees we collected half-inch long, light green curculionids (*Pachnaeus* sp.) which are quite common, also white *Artipus* mentioned above, Coccinellidae (*Cycloneda sanguinea*, *Chilicorus cacti*), Pentatomidae (*Thyanta* sp.), leaf-legged bugs (*Leptoglossus* sp.), occasional Mantidae, and walking sticks (*Phasmatidae*). The black mangrove when in flower had swarms of oedemerid beetles crawling over its blossoms and also attracted many flies, wasps, large blue-black carpenter bees, and two species of leaf-cutting bees (Megachilidae). On the other side of the trees was a hard sandy belt, wet at high tide, which was filled with dead or dying bushes, old stumps, and tangled debris, a haven for buprestid beetles: the small *Paratyndaris suturalis* and *Chrysobothris sexfasciata* that clung to the ends of small twigs, and the larger *Chrysobothris chryseola lernerii* and *Actenodes auronotata brederi* that rested on branches or trunks. Under loose bark in this area we took some of the small Tenebrionidae that came to lights at night.

A broad, more or less bare alley, partially flooded at spring tides, continued southward along the edge of the swamp (fig. 4) with black and white mangrove and white button wood (*Conocarpus erecta*) on its borders. Here were many specimens of a large buprestid (1 inch or more in length), *Psiloptera bahamica*, on the leaves or stems, and occasional individuals of two other buprestids, *Polycesta abdita* and *P. angulosa*, usually on the trunks of the mangrove. At one place on numerous dead twigs the tiny buprestid *P. suturalis* mentioned above was so often found that we called the area "*Paratyndaris* Boulevard" (fig. 5). Off this "boulevard" were barren sandy clearings encircled by dead

bushes and inhabited, in addition to buprestids, by tiger beetles, flies, and wasps. According to Howard (1950, p. 333) this western margin along Cavelle Pond is being invaded by some of the black land plants from the ridge (fig. 6). In a grassy area near by Cazier made an exciting capture of the variegated *Acmaeodera marginenotata*, a buprestid of which but one specimen had been taken the year before.



FIG. 4. Western edge of Cavelle Pond; young black mangrove (*Avicennia*) at right; white mangrove (*Laguncularia*) and button wood (*Conocarpus*) at left.

At Rolle's clearing on the ridge many *Actenodes auronotata brederi* buzzed from dead tree to dead tree as we hastily pursued them. They and *Polycesta* are much more difficult to catch than some other buprestids because they seem to prefer unyielding surfaces, as the tree trunk itself, and so can easily avoid the net. We were able to take a number of individuals of *Chrysobothris chryseola leneri*, usually quick-flying, on what appeared to be

their favorite fence posts, merely by reaching the whole hand from behind the post. On some leaves near these posts in July we were surprised to find *Neoclytus bahamicus*, a species that emerged from the cages in the laboratory but that had been taken only once before in the field, in 1950.

In what we called the "jungle" behind Rolle's yard is a narrow path along which we swept a series of a small red curculionid of



FIG. 5. Western edge of Cavelle Pond, "Paratyndaris Boulevard," with *Psiloptera* trees (*Laguncularia* and *Conocarpus*) in right background.

the subfamily Attelabinae (*Euscelus* sp.). Tarantula hawks (Pompilidae) occasionally flew by on this path, and it was here that there was enough leaf-mold material to collect for the Berlese funnels (fig. 7). One day, traversing the path, we heard a squeaking, strident series of sounds somewhat like those emitted by young birds, but when we pushed our way into the brush we found the noise came from great numbers of large brown crickets

which were clinging to the dead, hanging fronds of a palm or palmetto. As we collected them, they ran up and down our clothes.

From Rolle's place we usually continued southward on the beach path (fig. 8) through the coastal rock community, making short excursions into the thorny shrub vegetation of palms, palmettos, and underbrush where openings of a sort had been



FIG. 6. Western edge of Cayelle Pond; mangrove and incipient blackland.

hacked through. The clearings within often produced *Mydas brederi* and the day-flying cerambycids *Derancistrus scabrosus* and *D. cinnamipennis*, the latter being much less common. All three of these insects seemed to disappear about the end of July. A single specimen of a genus of buprestid, *Cinyra*, new to the Bahamas, was taken in this area by Cazier, and I found a new species of *Xenorhipis*, a genus also not found previously in the islands but which had emerged from rearing cages in the labora-

tory. The lower end of the path where it turns away from the beach became to us "*Psiloptera* Alley" since *bahamica* was so abundant there.

Another daytime collecting area on South Bimini was the northeastern shore, but it could be visited at high tide only, as the bay water was too shallow for the outboard motor at other times. Much of this coast is rimmed with mangrove, but a rocky



FIG. 7. "Jungle" path behind Rolle's on Sampson's ridge. Sifting for small insects.

sandy strip of a mile or more is free of this plant and we collected along the edge a few times, penetrating the shrub vegetation in many places. Most of the insects were the same as on western South Bimini: *Mydas brederi*, *Derancistrus scabrosus*, *Psiloptera bahamica*, *Polycesta abdita* and *angulosa*, *Actenodes auronotata brederi*, Meloidae (*Zonitis piezata*), Chrysomelidae (*Cryptoccephalus* spp.), Xylocopidae or carpenter bees, etc. A scarab not taken elsewhere, however, was collected by Charles Vaurie

as it flew along a small inland path, *Rutela formosa*, a beautiful striped cetonid. He also took the second Bimini specimen of *Chrysobothris tranquebarica*, a buprestid that is widespread throughout the West Indies (Fisher, 1925), but seemingly scarce in the Bahamas. Its food plant is the red mangrove and the Australian pine, both plentiful in the Biminis so that it is strange no more were seen.



FIG. 8. Beach path looking south. Coastal rock area.

At night we could land either where we usually did in the daytime or halfway down the western coast at Rolle's place. Night collecting near and in the mangrove swamp at the northwestern part of the island and in the vicinity of Cavelle Pond resulted primarily in hordes of Alleculidae, Oedemeridae, and Elateridae on the collecting sheets and a fair number of other insects taken by jack lighting through the vegetation. An exception to this lack of variety was "Charlie's tree" (fig. 9), a dead *Spondias pur-*

purea, or hog plum, from which, one night, Charles Vaurie took at least 40 specimens of small gray Cerambycidae (*Leptostylus argentatus*, *L. bahamicus*, *Lepturgis guadeloupensis*, and others), all from the lower branches only.

A far greater number of species and individuals, especially of cerambycids, was found at Rolle's burnt-over yard on the ridge which is the place we frequented most often at night.



FIG. 9. Dead *Spondias purpurea*, northwestern South Bimini.

Specimens of the four families of Coleoptera mentioned above were all very numerous here, and in addition we took the following beetles from the sheets in large numbers: small Ostomidae, *Ostoma soror* and *O. limbalis*; small Bostrichidae, *Tetrapriocera longicornis* and *Xylomeira torquata*; Cucujidae, *Scalidia linearis*, and the flat *Hemipeplus marginipennis*; the equally flat, but shorter Tenebrionidae, *Doliema bidens*; also a small black *Erotylathris* species of the Colydidae; *Hyporrhagus punctulatus*

of the Monommidae; and a number of unidentified Scolytidae, Platypodidae, Phalacridae, Heteroceridae, and Tenebrionidae. Many of the above were taken also on the bark of trees. Less numerous on the sheets were Melasidae (*Nematodes*, *Dromaeolus*), Scarabaeidae, Staphylinidae, Chrysomelidae (*Cryptocephalus azureipennis*), Nitidulidae (*Lobiopa insularis*), Carabidae, Dryopidae (*Pelonomus obscurus gracilipes*), and Cleridae (*Orthopleura damicornis*). A single specimen of *Trox* (Scarabaeidae), a *Macrosaigon* (Rhipiphoridae), and *Caryobruchus gleditsiae* (Bruchidae) landed on the sheets on different nights, never to be taken again. Some Cerambycidae came fairly regularly to the sheets, notably the short-winged, small *Methia necydalea*, *Cylindera flava*, *Merostenus attenuatus*, *Anoplium nanum*, *Elaphidion fasciatum*, and *Anopliomorpha xylebora*.

In addition to Coleoptera many green Pentatomidae (*Thyanta*, *Banasa*) buzzed on the sheets, also Cicadidae; there were many small roaches, many Cydnidae or burrowing bugs, Notonectidae, small Lepidoptera, mostly pyraloids, a few ants and other Hymenoptera, an occasional tabanid fly, and, on two or three successive nights, small black crickets.

Although some Cerambycidae, as mentioned, came to the sheets, the majority were hand picked from the trees. This family of longhorn beetles is, as Wickham remarked for Eleuthera, "a noticeable feature of the island" (*in* Nutting, 1895), but its members could never have been found in such numbers if they had not been attracted by the burning and felling of so much vegetation. At Rolle's place, by repeatedly running the head lamp over every tree and stump, every pile of dead brush, almost every twig, we collected from 80 to 200 of these wood borers a night, with a total count (for the four months of 1951) of over 6000 specimens, comprising 38 different species. Most numerous were the black and white *Elaphidion irroratum*, the small brownish *Anoplium nanum*, the buffy *Eburia bahamicae*, with its variable longitudinal white dashes on the elytra, and three of the small gray species, *Leptostylus argentatus*, *L. bahamicus*, and *L. incrassatus*. Fewer individuals were taken of the gray *Elaphidion manni* and *Anelaphus inerme*, of *Lepturgis guadeloupensis*, *Eupogonius wickhami*, and *Lypsimena fuscata*. Not more than half a dozen specimens were collected of the following species: *Euryscelis suturalis*, reddish brown in color and with extremely long legs; *Calocosmus venustus*, orange and blue; *Heterops*

dimidiata, red and blue; *Plectomerus costatus*, banded with yellow; *Trichrous pilipennis*, red and blue; *Ataxia spinicauda*; and *Stizocera punctiventris*. The largest cerambycids (2 to 4 inches long) were *Stenodontes chevrolati* which inhabited one of the largest trees on South Bimini, the hog plum (fig. 3, center, and fig. 9). At night they came out of deep holes in the trunks or branches, or rested under flaps of loose bark. Two individuals were captured flying into the light of the head lamps.

Although the majority of Bimini insects are far smaller than *Stenodontes*, there are a few as large or larger: the common cicada, a grasshopper, a species of Odonata, of Neuroptera, a walking stick, and a large spider of the family Ctenidae.

Other Coleoptera captured at night on trees, bushes, or fallen wood include a number of Curculionidae (*Cossonus* sp., *Myrmex* sp., *Erodiscus tinamus*, Cryptorhynchinae spp., including *Acalles apicalis*); a species of Brentidae; the larger Ostomidae (*Temnochila* sp.); a large, round, black Scolytidae, large for that family; Anthribidae, usually on dead palm fronds; and Chrysomelidae (*Metachroma* sp.) on flowering palmettos. These flowers also attracted oedemerids, alleculids, tenebrionids, and the cerambycids *Eburia* and *Elaphidion*. The strange thread-legged bug (Emesidae) was sometimes found swinging among the twigs, and in crevices in the branches we took the fat cricket *Tafalisca*. Diurnal insects were also taken sparingly at night, usually from the ends of twigs: some flies (Tabanidae; Syrphidae of the genus *Baccha*), buprestid beetles (*Actenodes*, *Psiloptera*, *Chrysobothris*), cicadas, and dragonflies. The last-named became confused if the head lamp rested on them too long, fluttering into it and our faces over and over again. Both they and the cicadas became much more abundant in August than they were in June.

Some large hairy spiders (*Cupiennius* sp.) inhabited the "bur-lap" and crevices of the palm trees, as well as small scorpions, roaches, and flat spiders (*Selenops* sp.). Most fascinating were various trap-door spiders whose presence was unsuspected until a lantern was set down on the sand near vegetation. Then suddenly a round piece of sand about the size of a dime would pop up, and a small dark form would protrude tentatively. These spiders could sometimes be caught by inserting a stick or forceps below the trap door, but they were very quick and often eluded capture. Spiders of the family Zodariidae, which cap their burrows with sand somewhat in the manner of the trap-

door spiders, were more abundant and left their holes to scurry after insects attracted by the lantern. Also abundant were the "bank wolves," *Arctosa littoralis*, chalky white spiders that had their burrows behind the white sandy beach or in open sandy areas inland. With the head lamps we picked out the shining eyes of Lycosidae or ground spiders, then collected them by hand. Now and then a wandering male tarantula was found in sandy areas, and a very large female, noted a year earlier by Cazier, was still occupying, in 1951, her burrow retreat 5 feet above the ground in a dead stump.

There were other night prowlers besides ourselves, some of them also interested in insects and spiders. Small lizards were usually fast asleep on the twigs, but small boa constrictors and a species of *Hyla* frog moved about in the vegetation. The frogs often sat timidly on the edge of our sheets, just looking, but a bold individual once advanced to the middle in pursuit of a cicada. It was a large mouthful for him but it went down, head first.

The other "entomologists" were large, 12- to 15-inch-spread land crabs common to all the islands. These were so numerous on South Bimini that when we arrived at dusk at Rolle's place their bodies seemed a moving carpet as they clattered off into the brush. When we left the sheets untended for long, we often found three or four of these monstrous animals grouped around the lantern on our return. Pieces of mangled insects showed what they had been doing. Usually they scuttled off at our approach but sometimes they had to be chased away.

The most insistent and ever-present night sound on South Bimini was the whine of the mosquitoes. Next came the "click-click" of hidden land crabs as they nibbled on dead leaves. At times cicadas buzzed on the sheets and scarabs whirred noisily. Once in a long while a frog croaked, and only once, after a rain, there was a brief frog chorus. Occasionally a loud squawk from a disturbed night heron pierced the air, and at 9:30 every night an airplane flew quite low overhead. Often strong gusts of wind rustled the palmetto fronds, and when the wind was from the west we could hear the drone of the waves on the shore. At 11 P.M. the ever-louder throb of the motor boat called us to the beach for the ride back to North Bimini.

Of the 52 families listed in table 1 as occurring in the Bahamas, 48 were taken by the American Museum collectors in the Bimini group. Since these islands are among the smallest and most

TABLE 1
COMPARISON OF NUMBER OF FAMILIES AND SPECIES OF COLEOPTERA REPORTED FROM
BIMINI WITH THOSE FROM ALL THE BAHAMAS

Family	No. of Species from Bimini, 1950-1951	No. of Species from all Bahamas (Blackwelder, 1944-1947)
Alleculidae	3?	2
Anobiidae	3	—
Anthicidae	1	—
Anthribidae	5?	—
Bostrichidae	5	—
Brenthidae	1	1
Bruchidae	2	1
Buprestidae	19	7
Cantharidae	1	1
Carabidae	16?	6
Cerambycidae	38	22
Chrysomelidae	18	8
Cicindelidae	2	2
Cleridae	2	—
Coccinellidae	3	5
Colydiidae	2	—
Cryptophagidae	1?	1
Cucujidae	4	—
Curculionidae	27	5
Dryopidae	1	—
Dytiscidae	6	—
Elateridae	10?	3
Gyrinidae	—	1
Helodidae	1	—
Heteroceridae	1	—
Histeridae	6	—
Hydrophilidae	13	—
Lagriidae	1	—
Lampyridae	—	2
Lathrididae	1	—
Lycidae	1	1
Melasidae	2	—
Meloidae	1	—
Monommidae	2	1
Mordellidae	2	—
Mycetophagidae	—	1
Nitidulidae	3	3
Oedemeridae	6	2
Orthoperidae	1	1
Ostomidae	4	—
Phalacridae	2?	—

TABLE 1—*Continued*

Family	No. of Species from Bimini, 1950-1951	No. of Species from all Bahamas (Blackwelder, 1944-1947)
Platypodidae	1	—
Pselaphidae	2?	—
Ptiliidae	6	—
Ptinidae	—	1
Rhipiphoridae	1	—
Scarabaeidae	10?	9
Scolytidae	3	—
Scydmaenidae	2?	—
Sphaeridae	2	—
Staphylinidae	7?	8
Tenebrionidae	9?	4
Total	262+	98

barren of the Bahamas, it can be seen that the published records of Bahaman beetles in no way represents the actual fauna of all the Bahamas.

As is shown in the table, the Cerambycidae, Curculionidae, Buprestidae, Chrysomelidae, and Carabidae were found to be the families richest in the number of species, followed closely by the Elateridae, Hydrophilidae, Tenebrionidae, and Scarabaeidae. Some other families, however, were as numerous, or more so, in the number of individuals taken; these are the Monommidæ, Alleculidae, Oedemeridae, and Bostrichidae. The families most poorly represented, by fewer than 10 individuals, are: Cleridae and Dryopidae by nine specimens each, Histeridae by eight, Cantharidae by seven, Lagriidae by five, Lathrididae by three, Cryptophagidae, Orthoperidae, and Anthicidae by two, Helodidae and Rhipiphoridae by only one individual. The Ptiliidae were the most numerous Coleoptera taken. So many of them were in the debris from the Berlese funnels that when the alcohol vials in which they were collected were shaken the beetles formed a black cloud.

REFERENCES CITED

BANKS, N.

1906. Arachnids from the Bahamas. *Bull. Amer. Mus. Nat. Hist.*, vol. 22, pp. 185-189.

BATES, M.

1934. New Lepidoptera from the Bahamas. *Occas. Papers Boston Soc. Nat. Hist.*, vol. 8, pp. 133-138.

BLACKWELDER, R. E.

- 1944-1947. Checklist of the coleopterous insects of Mexico, Central America, the West Indies, and South America. Bull. U. S. Natl. Mus., no. 185, pts. 1-5.

CAMBRIDGE, F. O. P.

1901. On a collection of spiders from the Bahama Islands made by J. L. Bonhote, Esq., with characters of a new genus and species of Mygalomorphae. Ann. Mag. Nat. Hist., ser. 7, vol. 7, pp. 322-332.

CAZIER, M. A.

1951. The Buprestidae of the Bahama Islands, British West Indies (Coleoptera, Buprestidae). Amer. Mus. Novitates, no. 1517, pp. 1-9, fig. 1.
1952. Additions to the buprestid fauna of the Bahama Islands, British West Indies (Coleoptera, Buprestidae). Amer. Mus. Novitates, no. 1562, pp. 1-10, figs. 1-5.

CLENCH, H. K.

- 1941a. Notes on two Bahaman Lycaenidae, with the description of a new subspecies. Torreia, no. 7, pp. 3-7.
1941b. A new race of *Hemiargus* for the Bahamas (Lepidoptera: Lycaenidae). Mem. Soc. Cubana Hist. Nat., vol. 15, pp. 407-408.
1942a. A new Bahaman *Eurema* (Lepidoptera, Pieridae). *Ibid.*, vol. 16, pp. 1-2.
1942b. The identity of the Florida race of *Leptotes* (Lepidoptera, Lycaenidae). Jour. New York Ent. Soc., vol. 50, pp. 243-244.
1942c. The Lycaenidae of the Bahama Islands (Lepidoptera, Rhopalocera). Psyche, pp. 52-60.

COMSTOCK, W. P.

1944. Insects of Porto Rico and the Virgin Islands. Scientific Survey of Porto Rico and the Virgin Islands, New York Acad. Sci., vol. 12, pp. 421-622.

CURRAN, C. H.

1951. The West Indian species of *Mydas* and *Proctacanthus* (Diptera: Mydidae and Asilidae). Amer. Mus. Novitates, no. 1507, pp. 1-9.

FISHER, W. S.

1925. A revision of the West Indian Coleoptera of the family Buprestidae. Proc. U. S. Natl. Mus., vol. 65, pp. 1-207.
1950. A revision of the North American species of beetles belonging to the family Bostrichidae. Misc. Publ. U. S. Dept. Agr., no. 698, pp. 1-157.

HAMPSON, G. F.

1901. The Lepidoptera-Phalaenae of the Bahamas. Ann. Mag. Nat. Hist., ser. 7, vol. 7, pp. 246-261.

HOWARD, R. A.

1950. Vegetation of the Bimini Island group, Bahamas, B. W. I. Ecol. Monogr., vol. 20, pp. 317-349, figs. 1-28.

JOHNSON, C. W.

1908. Diptera of the Bahamas, with notes and description of one new species. Psyche, pp. 69-80.

LENG, C. W., AND A. J. MUTCHLER

1914. A preliminary list of the Coleoptera of the West Indies as recorded to January 1, 1914. Bull. Amer. Mus. Nat. Hist., vol. 33, pp. 391-493.

1917. Supplement to preliminary list of the Coleoptera of the West Indies. *Ibid.*, vol. 37, pp. 191-220.
1922. The Lycidae, Lampyridae and Cantharidae (Telephoridae) of the West Indies. *Ibid.*, vol. 46, pp. 413-499.
- NUTTING, C. C.
1895. Narrative and preliminary report of Bahama expedition. Bull. Labs. Nat. Hist. State Univ. Iowa, vol. 3, pp. 1-251.
- SHARPE, E. M.
1900. On a collection of butterflies from the Bahamas. Proc. Zool. Soc. London, pp. 197-203.
- SHATTUCK, G. B. [EDITOR]
1905. The Bahama Islands. New York, the Macmillan Co., pp. 1-630, pls. 1-93.
- VAURIE, C.
[In press.] Observations and new records of birds from the Biminis, north-western Bahamas. Auk.
- VAURIE, P.
1952. The checkered beetles of the Bahama Islands, British West Indies (Coleoptera, Cleridae). Amer. Mus. Novitates, no. 1547, pp. 1-5, fig. 1.
- WHEELER, W. M.
1905. The ants of the Bahamas, with a list of the known West Indian species. Bull. Amer. Mus. Nat. Hist., vol. 21, pp. 79-135, pl. 7.