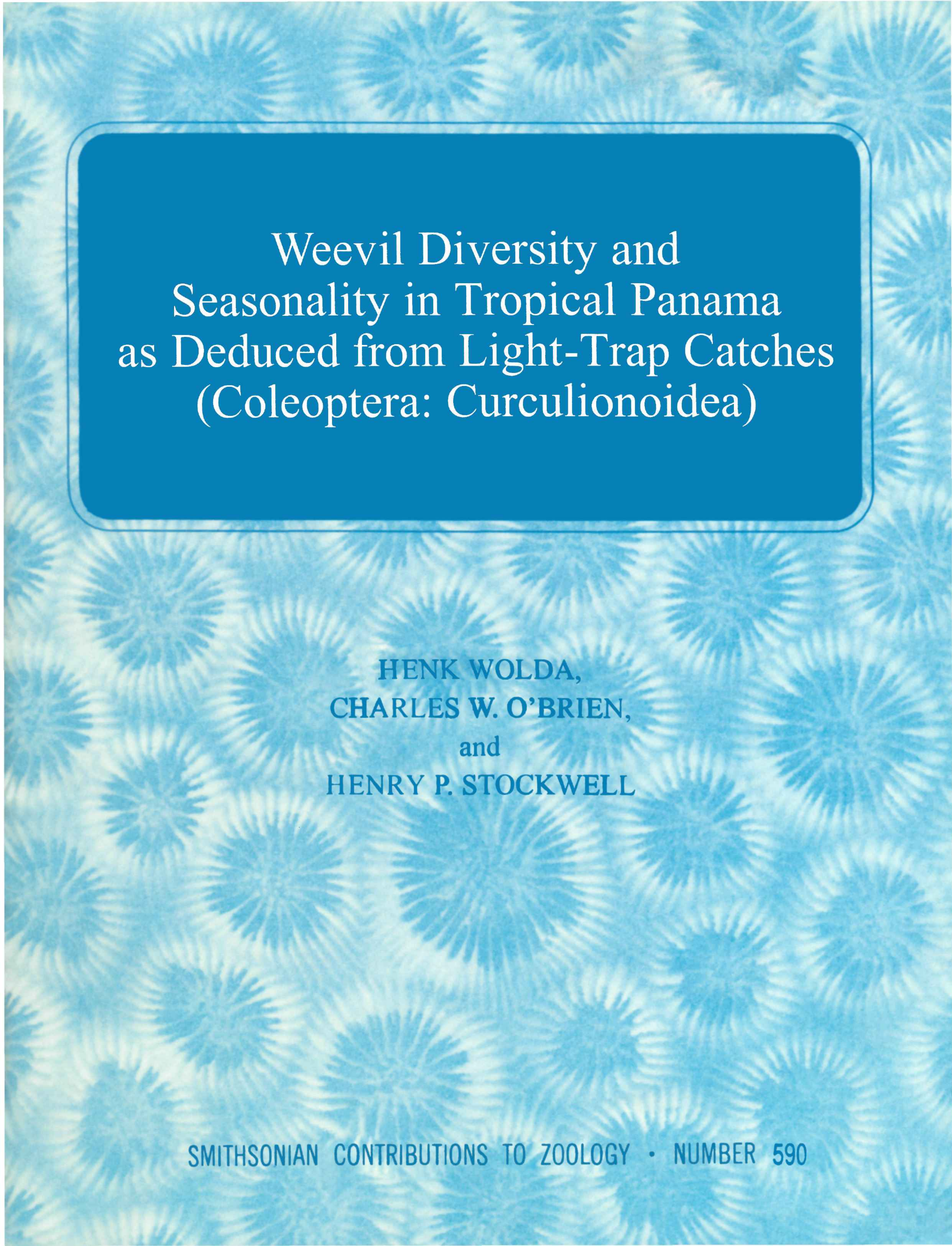

Weevil Diversity and Seasonality in Tropical Panama as Deduced from Light-Trap Catches (Coleoptera: Curculionoidea)

HENK WOLDA,
CHARLES W. O'BRIEN,
and
HENRY P. STOCKWELL

SMITHSONIAN CONTRIBUTIONS TO ZOOLOGY • NUMBER 590

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ABSTRACT

Wolda, Henk, Charles W. O'Brien, and Henry P. Stockwell. Weevil Diversity and Seasonality in Tropical Panama as Deduced from Light-Trap Catches (Coleoptera: Curculionoidea). *Smithsonian Contributions to Zoology,* number 590, 79 pages, 9 tables, 27 figures, 1998.—Weevils were collected with light traps at seven localities in the Republic of Panama, varying in altitude from sea level to 2200 m, in climate from sharply seasonal to virtually nonseasonal, and in habitat from natural tropical forest to areas strongly disturbed by humans. Although only an estimated 25-40 percent of the species of weevils present in an area were attracted to light, a total of 2086 species was nonetheless obtained in the traps. On Barro Colorado Island (BCI), the canopy trap caught more individuals but fewer species than the trap near the ground. Species richness (alpha-diversity) varied greatly between sites, BCI being the richest and the high-altitude site of Guadalupe Arriba being the poorest. Using the logseries as an arbitrary but useful basis for comparison, there were too many rare species and too few species of intermediate abundances at all sites. Between-site (beta-) diversity was also large, with one-third to two-thirds of the species at each site being only observed at that site, whereas species occurring at four or more sites were very rare.

Descriptors of seasonal patterns are proposed that were borrowed from circular statistics, such as Mean Vector and Mean Week. The former indicates the degree of seasonality, i.e., the concentration of the individuals in a year, which ranges in value from zero (uniform distribution) to unity (all individuals occurring at the same time), whereas the latter indicates the circular mean of the seasonal distribution. These were used in conjunction with other seasonality measures, such as Peak Week, which is the mode of the seasonal distribution. For all six sites with at least one year of data, these measures were calculated for each year for all species with at least 10 individuals in that year. A very rich variation in seasonal patterns was observed among species, ranging from species with very short seasons to species occurring year-round, sometimes without any clear seasonal peaks. At the climatically seasonal sites and at one less seasonal site, most species exhibited their maximum abundance at the beginning of the rainy season. However, at all sites some species were active or even had their mean or maximum abundance at any time of the year. Most species demonstrated very similar seasonal patterns in successive years, apart from shifts of a few weeks related to the actual beginning of the rainy season, but there were some clear exceptions. Similarly, for most species that occurred at more than one site in reasonable numbers the seasonal patterns were rather similar in those different sites in spite of differences in habitat, seasonality, or altitude. However, there were a number of species with spectacular differences in seasonal patterns at different sites. In some cases such differences could partly be attributed to differences between the sites, in others they could not. Species with an intermediate degree of seasonality showed a higher variability between sites than between years within sites.

The results were compared with those obtained for weevils from temperate areas. To the best of our knowledge, this is the first study on between-year and between-site comparisons in seasonality with a large number of tropical insect species.

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Contents

Weevil Diversity and Seasonality in Tropical Panama as Deduced from Light-Trap Catches (Coleoptera: Curculionoidea)

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Introduction

It is a well-established fact that, as in temperate species, seasonality is a common phenomenon among tropical insects. Since the classic studies by Dobzhansky and Pavan (1950) and Bigger (1976) a fair number of papers have been published showing that tropical insect species range from aseasonal to sharply seasonal even in relatively aseasonal climates, a variation much larger than that found in the temperate zone. For a review see Wolda (1988). For some species there is information on between-year similarities in seasonal patterns (Patil and Thontadarya, 1983; Wolda, 1982, 1983c, 1989) suggesting that between-year differences in seasonal abundance patterns do exist, but that they are small, comparable to similar differences occurring in the temperate zone where a season may start a few weeks earlier or later as a consequence of a variation in the weather in spring. Similarly, information on between-site differences in seasonality of individual tropical insect species is rare. Agarwala and Bhattacharya (1993) found that the seasonal abundance patterns of the aphid *Toxoptera aurantii* Boyes de Fonscolombe in India was very different in two climatically different sites. Aouad (1988) observed the hydrophilid beetle *Berosus affinis* Brullé in Morocco to be univoltine in temporary ponds and bivoltine in permanent ponds. Arbeille (1987) found an effect of fire on voltinism in some cockroaches in the Ivory Coast. Reddy and Krishnamurthy (1976–1977) observed between-site differences in seasonal patterns in some *Drosophila* species near Mysore, India. Rutledge et al. (1976) found large between-site differences in seasonality in species of Panamanian sand flies. Sevastopulo (1976) noted strong differences in seasonality of *Charaxes* butterflies in Kenya between coastal gardens and inland savannahs. In temperate areas between-site variations in seasonal patterns are commonplace, especially along latitudinal gradients. Similarly, between-year variations in phenology are well studied in many insects. However, because a cold season usually limits the time in which insects can be active, the range of variation tends to be relatively small, usually restricted to a variation in the number of generations per year. Information on seasonal patterns of species of weevils is rare, especially for tropical ones.

The present paper analyzes diversity and seasonal patterns in abundance, as shown by light-trap catches, for a large number of weevil species in seven localities (six for seasonality) in the Republic of Panama. These sites range in altitudes from 0 to 2200 meters and cover a variety of patterns of climatic seasonality. Species richness at each of seven sites, as demonstrated by the light traps, is presented, and the distribution of seasonal patterns at the six sites with at least one full year of data is discussed. Because we could find no satisfactory method in the literature to describe and summarize seasonal abundance patterns, elements of circular statistics are proposed here as descriptors of seasonality. From four sites between-year variation in seasonality, rather large in some species, is described, as is between-site variation in seasonality

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Henk Wolda, Henry P. Stockwell, Smithsonian Tropical Research Institute, P.O. Box 2072, Balboa, Republic of Panama; Charles W. O'Brien, Florida A. & M. University, Entomology-Biocontrol, Tallahassee, FL 32307-4100, U.S.A.

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for those species that occurred in reasonable numbers at more than one locality.

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The study on Barro Colorado Island was partly funded by grants from the Smithsonian Environmental Science program. We thank all those who helped in collecting the daily samples, especially Bonifacio de León. The study in Fortuna was made possible thanks to the generous cooperation of Alcides Salas of the Instituto de Recursos Hidráulicos y Electrificación (IRHE). Personnel of the IRHE collected the daily samples from the light trap. The project in Boquete was carried out on the property of Alberto Sandberg and with the cooperation of various people of the Ministerio de Desarrollo Agropecuario in Boquete, especially Eleuterio Delgado. Rogelio Preto kindly let us use his house and property for the project at Guadalupe Arriba. Thanks are due to the untiring support of Cecilio Estribí of the Instituto de Recursos Naturales Renovables in the province of Chiriquí who, together with Lionel Quiros, stepped in immediately whenever there were problems either in Fortuna, Guadalupe Arriba, or Boquete. The project in Corriente Grande was partially funded and given logistical support by the IRHE and also helped by Abdiel Adames and his assistants of the Gorgas Memorial Laboratory in Panama City. The project in Miramar was partly funded by a Scholarly Studies grant from the Smithsonian Institution and received the generous practical help and logistical support of Yessim Yishui. Saturnino Martínez sorted the weevils out of all insect samples as they came in. We thank Tina Wolda, wife of the senior author, for her help in collecting the samples in Las Cumbres, and Angel Aguirre of the STRI Library in Panama as well as Zbigniew Witkowski (Kraków, Poland) for their help in locating weevil literature. Constructive comments by four reviewers are gratefully acknowledged. Horace R. Burke's detailed comments especially are deeply appreciated. The work by CWOB was supported in part by a grant, FLAX 850006, from the Cooperative State Research Service, U.S. Department of Agriculture.

Materials and Methods

STUDY SITES

Weevil composition, abundance, and seasonality were analyzed from light-trap samples collected at seven localities in Panama, Barro Colorado Island, Las Cumbres, Miramar, Corriente Grande, Boquete, Fortuna, and Guadalupe Arriba.

Barro Colorado Island (BCI), 9°9′19″N, 79°45′19″W, is the largest of the islands formed in the man-made Gatun Lake when this was flooded between 1911 and 1914 to form part of the Panama Canal. Light traps were located on a ridge at 120 meters above sea level in reasonably undisturbed forest. For details of the forest and its history see Croat (1978), Leigh et al. (1982), Foster and Brokaw (1982), and Piperno (1990). There were two traps, one at two to three meters above ground level and one in the canopy, 28 meters above the forest floor. For 20 years the traps operated virtually every night, all night, and the samples were collected in the morning and transported to the offices of the senior author for initial sorting. In early March 1977, the glass jar with CCl_4, used to collect and kill the insects collected by the trap, was replaced by a stainless steel receptacle with Kahle's solution. In October 1978, the traps were moved about 10 meters to a tree nearby. Weevils collected by these traps were sorted during three years, from March 1976 through March 1979.

Las Cumbres, 9°5′36″N, 79°31′54″W, 150 m above sea level, is a residential area with gardens and some second growth forest, 16 km north of Panama City. A single light trap was operated behind the house of one of the authors (HW) for a total of seven years on a ridge overlooking a wooded area. The trap operated virtually every night, all night, and weevils were sorted for three years, from March 1974 through March 1976 (see also Wolda, 1980).

Miramar, 9°0′N, 82°15′W, is at sea level, in the province of Bocas del Toro in NW Panama, on the SW corner of the Laguna de Chiriquí. The light trap was located on the edge of a pasture at the bottom of a very disturbed forested slope, with old cacao trees in the undergrowth. The trap operated every evening from dusk until 10 P.M. during one year, from November 1978 through November 1979. Due to logistic problems, data are missing for 12–30 June, 12–25 July, and 28–31 July (see Wolda and Flowers, 1985).

Corriente Grande, 9°17′30″N, 82°32′41″W, altitude 100 m, is a forested area along the Changuinola River, near a work camp of the Instituto de Recursos Hidráulicos e Electrificación (IRHE). For details of the area see Adames (1980). A light trap was operated here from dusk to 10 P.M. from mid-January through mid-May of 1980.

Boquete, 8°48′N, 82°26′W, altitude 1350 m, is in the mountains of Western Chiriquí province. The light trap was located in a forest remnant surrounded by coffee plantations on the property of Alberto Sandberg, in the community of Alto Lino, and was operated every night, all night, for three years. Weevils were sorted from the samples during two years, from July 1976 through July 1978.

Fortuna, 8°44′N, 82°16′W, altitude 1050 m, is a very wet forested mountain valley along the Rio Chiriquí, some 20 km east of Boquete (at present the study area is an artificial lake). A light trap was operated here daily from dusk to 10 P.M. in old, relatively undisturbed forest outside a work camp of the Instituto de Recursos Hidráulicos e Electrificación (IRHE), from late September 1976 to July 1979, the first nine months at canopy level, the subsequent two years a few meters above the forest floor (see Adames, 1977).

Guadalupe Arriba, 8°52′27″N, 82°33′12″W, altitude 2200 m is in a very wet cloud forest on the northwestern slopes of the Volcán Barú. A light trap was operated here daily from dusk to

TABLE 1.—Annual rainfall and temperature data for seven Panamanian localities as far as available. For Miramar and Corriente Grande, no data are available, so rainfall data from nearby Punta Robalo and Changuinola, respectively, are substituted. Temperature data from Almirante serves as a guideline for temperatures at these sites. No temperature data are available for Las Cumbres, but the BCI clearing data should be roughly applicable.

Locality	Annual rainfall		Rainy days		Temperature			
	N	Mean ± St.Dev.	N	Mean ± St.Dev.	N	Mean	Max	Min
BCI, Clearing	62	2614.0 ± 456.0	18	185.1 ± 20.8	17	27.1	30.9	23.3
BCI, Forest Floor	-	-	-	-	15	23.7	24.5	22.8
Las Cumbres	15	2134.2 ± 521.7	14	169.1 ± 21.3	-	-	-	-
Miramar	9	1814.7 ± 633.1	8	146.9 ± 25.6	-	-	-	-
Almirante	-	-	-	-	7	25.7	30.2	21.2
Corriente Grande	58	2519.1 ± 517.9	8	214.5 ± 37.3	-	-	-	-
Boquete	14	2481.5 ± 736.4	14	192.6 ± 26.6	8	20.3	25.6	15.3
Fortuna	14	4569.4 ± 839.2	14	326.7 ± 12.9	4	19.1	22.2	16.3
Guadalupe Arriba	2	3874.1 ± 1623	2	247.6 ± 30.3	2	14.5	16.5	12.6

10 P.M. Weevil data were analyzed from April 1983 through November 1984.

Rainfall data are available, though not necessarily for the years of our study, for all sites except Miramar and Corriente Grande. The data are from Caballero (1978, and other annual volumes in the same series) and Windsor (1990, and pers. comm.). The data from Punta Robalo, a few km north of Miramar, also on the coast of the Laguna de Chiriquí, should provide a reasonable estimate of the rainfall at Miramar. If there is a difference, the precipitation at Miramar would likely be slightly higher because of its closer proximity to the mountains. For Corriente Grande the rainfall data from Changuinola are the closest that are available and are used herein despite the fact that Changuinola is on the coastal plain and Corriente Grande is south of there in a valley in the foothills between some ridges. Temperature data for these two sites also are not available. The only data available are from Almirante, north of Miramar and east of Corriente Grande. We would expect Miramar to have roughly the same temperatures as Almirante and Corriente Grande, perhaps to be slightly cooler. No temperature information is available for Las Cumbres. Mean annual rainfall, summarized in Table 1, varied from a little over 1800 mm in Miramar to over 4500 mm in Fortuna, a difference emphasized by the number of rainy days, varying from 147 in Miramar to 327 in Fortuna. In the lowlands mean temperatures did not vary much among sites, but, as expected, in the mountains the temperatures were lower (Table 1).

At BCI, Las Cumbres, and Boquete there was a clear alternation of an 8-month rainy season and a 4-month dry season, the latter usually occurring from mid-December through mid-April (Figure 1). In the other three sites there was no distinct dry season. In Fortuna there was a slight decrease in monthly rainfall in March, and in Changuinola rainfall was bimodal, with less rain both in February/March and in September. Other sites in the province of Bocas del Toro, such as Chiriquí Grande, also on the coast of the Laguna de Chiriquí east of Miramar, showed this same bimodal rainfall, which makes it rather surprising that Miramar (assumed the same as Punta Robalo) did not show any seasonal changes. The dry season at Guadalupe Arriba was not very pronounced and there is a suggestion of bimodality in the rainfall. There was no detectable seasonal variation in mean temperature (Figure 2) anywhere except, perhaps, in Almirante and Guadalupe Arriba, with a minimum around December/January, but even here the annual variation is very small, with at most three degrees Celsius difference between June and December.

All these climatic data were from rain gauges and thermometers set up in regular meteorological cabinets installed in the open, whereas several of the light traps operated inside a forest (BCI, Corriente Grande, Boquete, and Fortuna) where conditions are likely to have been different. For temperature, such differences are shown by data from BCI (Table 1; Figure 2). Mean maximum temperature inside the forest, at 1 m above the forest floor, was 6.4°C lower than that outside the forest, whereas the mean nightly minimum showed only an 0.5°C difference. We have no rainfall data from inside the forest, but one should keep in mind that part of the rain falling on the canopy of the trees evaporates or is absorbed by the foliage and thus never reaches the forest floor, whereas another part comes down as stemflow, a flow of water along the branches and tree trunks, rather than as "rain." For further details on the climate on BCI see Windsor (1990).

COLLECTING METHODS

All weevils (Curculionoidea) reported in the present paper were collected by HW by means of modified Pennsylvania light traps as described by Smythe (1982). However, in all localities except Las Cumbres, Boquete, and the first year on Barro Colorado Island, the glass collecting jar containing carbon tetrachloride (CCl_4) as a killing agent was replaced by a stainless steel receptacle filled with Kahle's solution, a mixture of alcohol, formaldehyde, and glacial acetic acid (Borror and DeLong, 1971). Kahle's solution killed the insects

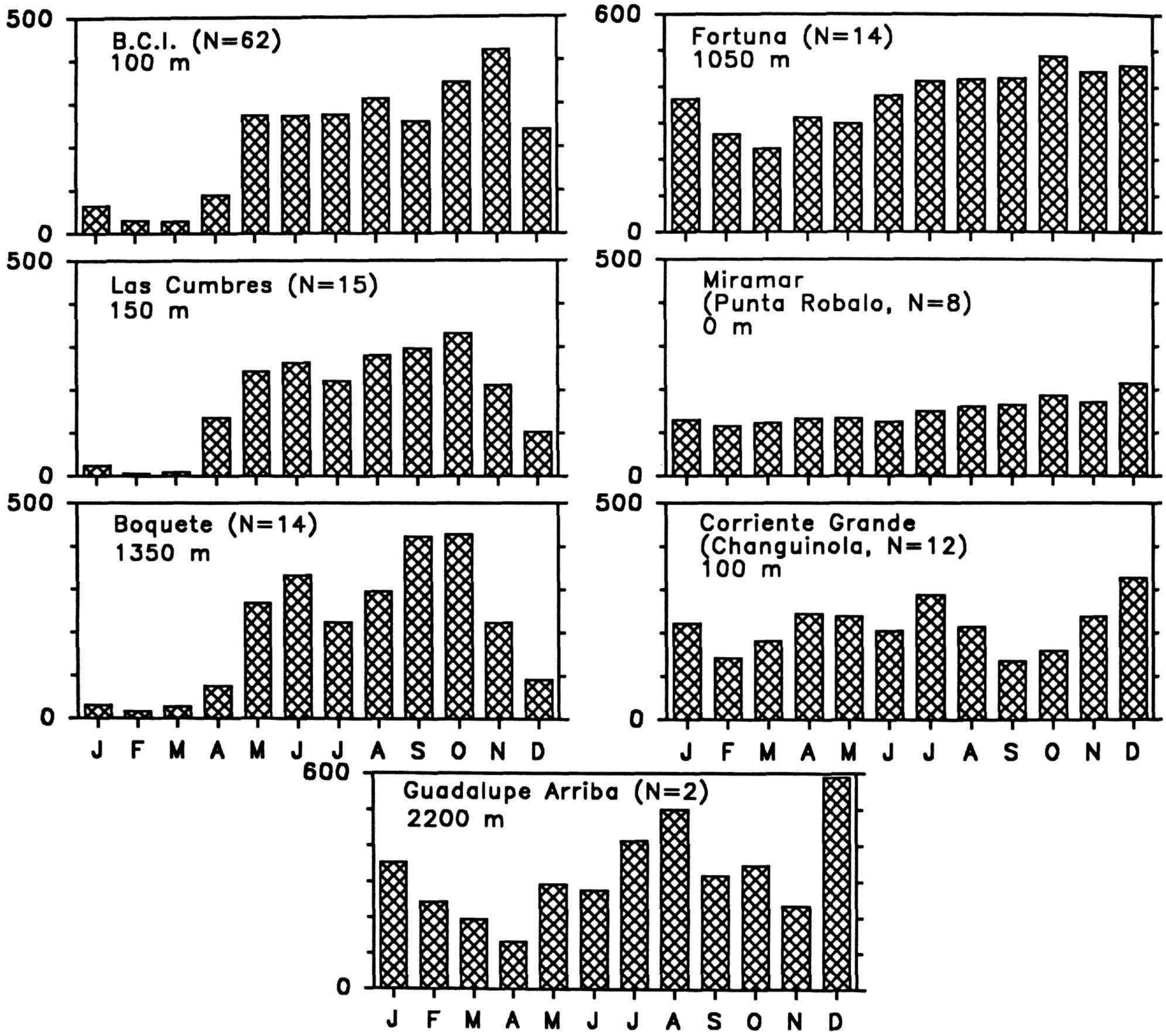


FIGURE 1.—Seasonal distribution of monthly rainfall in seven Panamanian localities.

much more quickly and generally preserved them in better condition.

Possible effects of the differences in the chemical environment of the trap and killing methods were briefly studied during one month in January/February 1980 in Las Cumbres when two traps were set up six meters apart on a ridge behind the house of HW, at the same spot the regular light trap had been operating. One trap was operated with a glass jar containing CCl_4 as a killing agent (the "dry" trap), the other with a stainless steel receptacle with Kahle's solution (the "wet" trap). In one month the wet trap (Kahle's solution) collected somewhat fewer weevils (99) than the dry (CCl_4) trap (125), but the difference was not significant statistically (x^2(1 d.fr.) = 3.02, p = 0.08), suggesting that an effect of the change from CCl_4 to Kahle's, if any, was fairly small.

Samples collected during the first two years at Las Cumbres were sorted to species by HPS, and the specimens are deposited in his collection at the Smithsonian Tropical Research Institute in Panama. All other samples were sorted to species by CWOB, and the specimens are in his collection in Tallahassee, Florida. The many unidentified and undescribed species were given reference codes. Special efforts were made to reconcile the

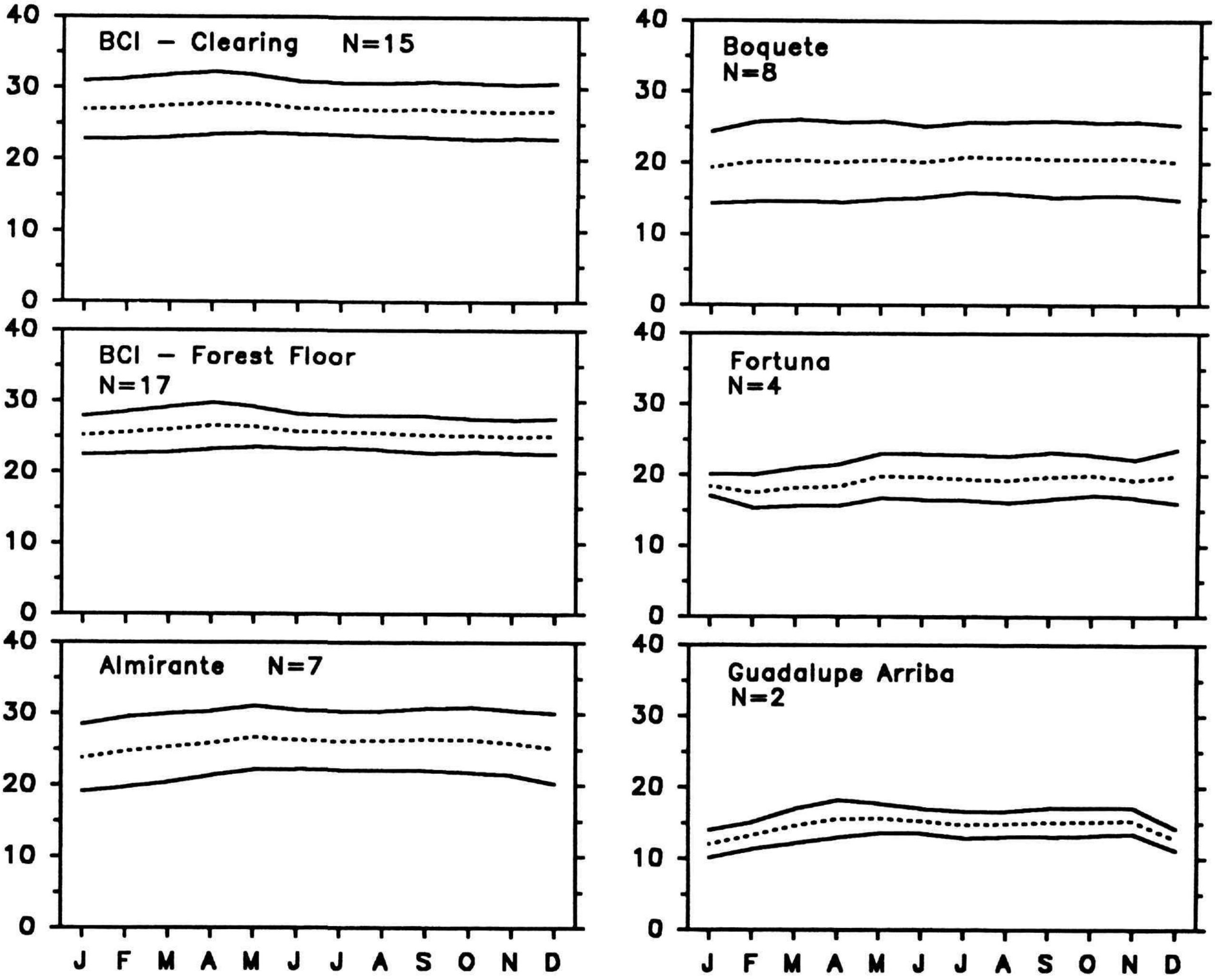


FIGURE 2.—Seasonal distribution of monthly means of maximum, mean, and minimum temperature in six Panamanian localities.

codes used by CWOB and HPS, but in order to ensure comparability of the data in the diversity section of the present paper, only the samples sorted by CWOB will be used, i.e., all samples available except the first two years at Las Cumbres. A complete list of the species identified by CWOB is given in the appendix.

Every effort was made to identify the weevils to species, and we are convinced that the vast majority, if not all, of the taxa recognized are good species. The exceptions were six taxa, one each in the genera *Apion* (Apionidae), *Notiodes, Phyllotrox,* and *Terires* (Curculionidae: Erirrhininae), and *Paratrachelizus* and *Stereodermus* (Brentidae). Each of these taxa may or may not contain more than one species and are listed as *Apion* complex, *Phyllotrox* complex, etc. In these genera several species were identified, but the remainder are referred to as belonging to a "complex." These complexes, with localities and numbers collected, are listed in Table 2. In spite of these mixed taxa, throughout this paper the designation "species" will be used when referring to individual taxa.

DATA ANALYSIS

At BCI and Las Cumbres, each collecting year started in early March. For example, the year designated as 1976, extended from March 1976 to March 1977, etc. Year designations in this paper do not necessarily coincide with calendar years.

DIVERSITY.—In order to compare diversity in different sites

TABLE 2.—List of the six weevil "taxa" recognized that probably are not single species (BCI = Barro Colorado Island, LC = Las Cumbres 1976, MIR = Miramar, CGR = Corriente Grande, BOQ = Boquete, FORT = Fortuna, GUA = Guadalupe Arriba.)

	Taxon	BCI	LC	MIR	CGR	BOQ	FORT	GUA	TOTAL
Apionidae	Apion complex	509	-	6	4	9	18	-	546
Brentidae	Paratrachelizus complex	-	-	20	2	-	-	-	22
Brentidae	Stereodermus filum complex	173	-	1	-	12	6	-	191
Curculionidae									
Curculioninae	Terires complex	8821	-	3	7	-	-	-	8831
Erirrhininae	Notiodes aeratus complex	-	3	-	-	-	-	-	3
Erirrhininae	Phyllotrox complex	43121	474	2564	115	29	204	3	46510
	TOTAL	52624	477	2594	128	50	228	3	56103

with different numbers of individuals, as well as different numbers of species, diversity indices can be useful. In spite of some problems, we prefer the "alpha" (α) parameter of the logseries (Fisher et al., 1943) as a diversity index over other popular indices, such as the Shannon-Weaver index (Taylor et al., 1976; Wolda, 1983a, 1984). If the basic assumptions for the use of the index are fulfilled, the diversity at different sites can be compared directly in spite of differences in the number of individuals. Moreover, it seems that the usefulness of α is fairly robust to departures from the assumptions, especially departures from the logseries distribution.

Comparisons between collections of weevils from different sites or different years can be made best by means of similarity indices. Most such indices present problems of some kind (Wolda, 1981), but the NESS index (Grassle and Smith, 1976; Smith et al., 1979), a generalization of the Morisita index (Morisita, 1959), is better than most in that its expected value for two samples from the same population is 1, its value does not depend on the diversity of each of the samples being compared and does not depend on sample size, except possibly for very small samples. The advantage of the NESS index over the Morisita index is that it takes into account the rarer species and that it has a variance estimate attached so that the indices can be used for statistical testing. The "m" parameter of the NESS index was taken as 20 wherever possible.

SEASONALITY.—Two phenomena are involved here. Within a year the abundance of an insect species may vary significantly and the pattern of this variation may or may not repeat itself over successive years. If it does, and thus is cyclical over time, it is referred to as truly seasonal; if not, it is not truly seasonal. One might argue that the term seasonal(ity) should not be used unless the observed pattern is proven to repeat itself from year to year. However, we find that avoiding the term seasonal(ity) confuses more than it helps. We will use seasonal and seasonality throughout this paper when referring to changes in abundance within a year, even if those changes were different in different years.

For seasonality analysis, only species for which at least 10 individuals were collected, i.e., with at least 10 data points on the annual cycle, were considered. It is impractical to present graphs of the hundreds of seasonal patterns that we observed. Therefore, to provide some semblance of order to the plethora of seasonal patterns, we decided to use circular statistics (Batschelet, 1972, 1981; Mardia, 1972), the weeks and months being basically circular rather than linear variables. The length of the "Mean Vector" r is an indication of the concentration of the individuals in some part of the year. Throughout the paper, "Mean Vector" is used as a shorthand for "length of the Mean Vector." The time of occurrence of each individual is calculated as an angle (ϕ) in degrees around the annual circle. For instance, for an individual found in week number 25 the angle ϕ is $25/52*360 = 173$ degrees. If x is the average of the cosines of all ϕ-values in a year and y is the average sine, the Mean Vector r is given by

$$r = \sqrt{x^2 + y^2}$$

The Rayleigh test (Batschelet, 1981) applied to this Mean Vector shows whether or not the distribution of the individuals over the year is significantly different from uniform or symmetrical. The direction of the mean vector over the year gives the "Mean Week," which is given by transforming the mean angle ϕ back to weeks

$$\phi = \begin{cases} \arctan(y/x) & \text{if } x > 0 \\ 180° + \arctan(y/x) & \text{if } x < 0 \end{cases}$$

and the Jupp-Mardia correlation coefficient r^2 (which can be larger than unity) correlates two circular variables (Batschelet, 1981:190). The "Angular Deviation" s is the circular equivalent of the standard deviation and is given by

$$s = \sqrt{2(1-r)}$$

To compare seasonality patterns in different years, for each species the average Mean Vector with its standard deviation was calculated, as well as the (circular) average Mean Week and its angular deviation, the Mean Week itself also being a circular variable. The relations between the two standard deviations and Mean Vector, as well as Mean Week, provide a useful summary of the between-year or between-site variation in seasonality patterns.

In addition to these circular measures of seasonality, the "Peak Week" was used, which gives the mode of the seasonal abundance pattern. It is calculated by taking the running 4-week average of the number of individuals, wrapping around the end and the beginning of the year because of the circular nature of the data, and finding the maximum of these running averages. The running averages rather than the original data were used in order to eliminate possible effects of the phases of the moon on the catches.

Other measures also were tried. The "Seasonal Maximum" (SM) (Wolda, 1979) is obtained by dividing the maximum number of individuals observed in a 4-week period by the total number of individuals observed over the year and multiplying it by 13, the number of 4-week periods in a year. SM runs between 1 (distribution over the year entirely uniform) to 13 (all individuals found in one period of four weeks). As expected, SM correlates with the Mean Vector. Using the residuals of the regression of SM on Mean Vector did not provide any useful extra insight into the nature of the seasonal patterns; therefore the relevant calculations are not included in the present paper.

Morisita's "index of seasonal diversity" ($1/I_\delta$) (Morisita, 1967; Yamamoto, 1974) is calculated as

$$\frac{1}{I_\delta} = \frac{1}{q * \dfrac{\sum_{i=1}^{q} n_i (n_i - 1)}{N(N-1)}}$$

where n_i = number of individuals in class i

q = number of classes

$$N = \sum_{1}^{q} n_i$$

If the classes are months, $q = 12$, if weeks, $q = 52$, etc. The higher the value of $1/I_\delta$, the more homogeneous the seasonal distribution. As will be shown (Figure 17), $1/I_\delta$ correlates with the Mean Vector. Although useful when used by itself, it, or its residuals of the regression of it on Mean Vector, do not add anything useful to the information already available; therefore the relevant calculations are not included in the present paper.

Circular statistics, as far as we know, deal basically with neat symmetrical unimodal seasonal distributions, ideally conforming to a Von Mises distribution (Batschelet, 1981), the circular equivalent of a normal distribution. Actual seasonal patterns of insects, however, rarely fit this description, which is why the Peak Week, the mode of the seasonal pattern, rarely coincides precisely with the mean of this pattern, the Mean Week. The difference between the two measures gives an indication of skewness of the seasonal distribution. This was found more illustrative of the patterns occurring than the formal measurement of circular skewness.

TABLE 3.—Between-year changes in abundance of weevils on BCI in some families and subfamilies classified either as woodborers or as non-woodborers.

	1976	1977	1978
Individuals	18293	29522	47518
Species	586	872	906
Woodborers:			
Brentidae (less *Ulocerus*)	269	548	1016
Ulocerus sordidus	113	315	6224
Cossoninae	575	2252	3330
Cryptorhynchinae	1564	3220	3572
Dryophthorinae	4	3	23
Magdalidinae	0	0	2
Zygopinae	227	433	383
Total	2752	6771	14550
Increase/Decrease		146.0%	114.9%
Total less *Ulocerus*	2639	6456	8326
Increase/Decrease		144.6%	29.0%
NonWoodborers:			
Anthonominae	76	361	495
Polydrosinae	18	58	1
Camarotinae	1	0	0
Ceratopodinae	31	107	145
Ceutorhynchinae	2	0	0
Erirrhininae (less *Phyllotrox*)	671	1823	1144
Phyllotrox complex	9617	12781	20723
Hyperinae	2	33	26
Entiminae	0	1	1
Prionomerinae	3	7	3
Tychiinae	2	11	15
Total	10423	15182	22553
Increase/Decrease		45.7%	48.6%
Total less *Phyllotrox*	806	2401	1830
Increase/Decrease		197.9%	-33.8%

Results

GENERAL REMARKS

EFFECT OF TRAP DESIGN AND OF THE DYING *Tachygalia* TREE.—The difference in killing methods and thus in the chemical environment of the light traps between Las Cumbres, Boquete, and the first year on Barro Colorado Island on one hand, and the other localities and years on the other, may or may not have affected the efficiency of the traps. The Las Cumbres experiment (see "Collecting Methods") suggested that the effect, if any, was minimal. However, an analysis of collections made before and after the change from CCl_4 to Kahle's solution between 1976 and 1977 on BCI also may be informative.

The total number of individuals and species of weevils caught each year on Barro Colorado Island is given in the first two lines of Table 3. At first sight these data suggest that the change from CCl_4 to Kahle as killing agents directly after 1976 resulted in a substantial increase in both the number of species and the number of individuals. There was, however, an important event that occurred in 1978 that clouds the issue. The light traps were suspended from a large tree, *Tachygalia versicolor* Standl. and Wms. (Leguminosae: Caesalpinoideae). This tree species is monocarpic, i.e., it flowers once during its entire life and then dies immediately (Foster, 1977). It is not quite clear whether the tree produces flowers because it is in the process of dying or whether flowering kills the tree. The tree to which the light traps were attached flowered in May 1978, attracting a large number of insects to its flowers (Wolda and Roubik, 1986) and to its apparently already dying wood. The condition of the tree deteriorated so rapidly that in October of that year branches were already falling off and the trap had to be moved to a tree nearby. Many weevils were among the insects aggregating at the dying tree. The large increase in the number of individuals between 1977 and 1978 (Table 3) was likely, at least in part, to have been associated with the death of the tree. The increase in the number of species, however, was minor compared with that in the previous year. Very little is known about the physiology of *Tachygalia* trees before and during flowering and its effects on visiting weevils. Nor is it clear whether the attraction to weevils started well before the flowering process began. Too little is known also about the life histories of weevils (Anderson, 1993), especially neotropical ones, to look specifically at species that might be attracted to dying *Tachygalia* trees. However, based on what is known in the literature and on the personal experience of two of us (COB and HPS), we classified families and subfamilies as either "woodborers" or "nonwoodborers," the latter including species that are leaf-miners, seed-, flowerbud-, or fruit-predators, stem borers of herbaceous plants, leaf-feeders, etc. A number of weevil families or subfamilies that could not easily be so assigned to either of these groups are ignored herein.

Many of the species classified as woodborers may not have been attracted to dying *Tachygalia* trees, but species that were are most likely to belong to this category and much less likely to be nonwoodborers. From 1977 to 1978 there were large increases in the number of individuals of both categories (Table 3), but this was much more evident among the woodborers. Much of the increase in individuals in 1978, when the tree flowered, was due to only a few species, especially *Ulocerus sordidus* Sharp, a woodborer (Brentidae), and *Phyllotrox* complex (Erirrhininae), a non-woodborer flower visitor, especially palm flowers. The latter taxon was by far the most common and was possibly attracted to the flowers of the *Tachygalia* tree. These two taxa alone contributed 13851 individuals to the overall increase of 17996 weevils between 1977 and 1978. Spectacular increases between these two years also were found in a number of other species, such as *Cryptorhynchinae* sp. #66 (from 2 to 527), *Conotrachelus* sp. #6 (from 2 to 73) and *Cryptorhynchinae* sp. #C155 (from 2 to 57). The increase in abundance among the woodborers associated with the flowering tree, not counting *Ulocerus sordidus*, was still 29%, whereas the increase from 1976 to 1977 remained at 145% (Table 3). Among the nonwoodborers, excluding the *Phyllotrox* complex, the numbers decreased from 1977 to 1978 by 34%, whereas from 1976 to 1977 the total number of nonwoodborers almost tripled (Table 3). There are obviously large differences in population behavior between woodborers and nonwoodborers, but these do not necessarily solve the problem. The increase among the woodborers from 1977 to 1978 compared with a decrease in the nonwoodborers fits the hypothesis of a strong attractant at the dying of the *Tachygalia* tree. The large increase in *Phyllotrox* complex demonstrates that other factors not associated with the dying tree may be operating. Some of the abundant palms in the trap area may have flowered in 1978, which would account for the large numbers of *Phyllotrox*.

The large to very large increase at this locality among both the woodborers and the nonwoodborers from 1976 to 1977 does not fit the hypothesis of an early attraction by woodborers to the *Tachygalia* tree. The problem is also that the species that showed a rather spectacular increase from 1977 to 1978 were not necessarily the ones that increased in the previous year, as one would expect if the hypothesis of an early attraction were true. In fact, for those species that had at least 20 individuals in the three years combined, the ratios of abundances in 1977 over those in 1976 versus these ratios of 1978 over 1977 had a highly significant negative correlation ($r = -0.267$, $n = 265$). This shows that increases tended to be followed by decreases and vice versa. Of the species that increased between 1977 and 1978 (47.5% of the total), only 40.3% showed an increase in 1976/1977, whereas 15.1% decreased and 44.6% remaining the same. The vast majority (90.6%) of the species that decreased between 1977 and 1978 (37.3% of the total) had increased in abundance in the previous year. All these points argue against the idea of a general early attraction of weevils to the dying *Tachygalia* tree. The fact that almost 60% of the species increased between 1976 and 1977, whereas only 17% decreased, strongly suggests that some other factor did improve the trap catches in 1977 and the change in chemical environment of the trap might provide the explanation. If the 1976/1977 increase was due to the chemical change, the Kahle's solution produced better weevil catches than CCl_4, which would run against the (nonsignificant) trend observed in the experiment in Las Cumbres. Numbers of insects do fluctuate from year to year, and in 1977 obviously many more weevils were caught than in 1976. Whether this was caused by the chemical changes in the trap or by some other unknown factor remains an open question. The *Tachygalia* tree did attract large numbers of woodborers when it flowered in 1978, but it probably did not do so in the year before flowering.

DIVERSITY

PER YEAR.—A total of 113,712 weevils were collected representing 2030 species (Table 4; Appendix), not counting

TABLE 4.—Collecting information, number of individuals, and number of species in seven sites in Panama as revealed by light-traps, plus the alpha diversity index based on the logseries. (Altitude is given in meters. HPS = H.P. Stockwell; CWOB = C.W. O'Brien.)

Locality	Altitude	Yrs	Period	Individ	Spp.	Spp/Yr	Alpha	Alpha/Yr
Barro Colorado Island	120	3	III 1976–III 1979	95333	1239	788	201.0 ± 5.7	148.5
Las Cumbres (HPS)	150	$2\frac{1}{2}$	X 1973–III 1976	6915	315	231	68.0 ± 3.8	56.5
Las Cumbres (CWOB)	150	1	III 1976–III 1977	4011	357	360	94.7 ± 5.0	97.2
Miramar	0	1	IX 1978–IX 1979	3992	170	172	36.1 ± 2.8	36.6
Corriente Grande	100	$\frac{1}{3}$	I–V 1980	2229	259	-	75.9 ± 4.7	-
Boquete	1350	2	VII 1976–VII 1978	2256	267	183	78.8 ± 4.8	62.9
Fortuna (Canopy)	1050	$\frac{3}{4}$	IX 1976–VII 1977	860	195	-	78.7 ± 5.6	-
Fortuna (low level)	1050	2	VII 1977–VII 1979	4640	367	248	93.9 ± 4.9	70.6
Guadalupe Arriba	2200	$1\frac{3}{4}$	IV 1983–IX 1984	391	51	36	15.7 ± 2.2	13.0
Total (excl. Las Cumbres HPS)				113712	2030		351.6 ± 7.8	

the 6915 individuals in 315 species from Las Cumbres analyzed by HPS. By far the largest collections were made on Barro Colorado Island. Weevils were collected here for three years, but were collected for two years or less at the other sites (Table 4). However, the average number of species per year on BCI (788) was much higher than at any other site. The numbers of individuals in the three years on BCI were 18293, 29522, and 47518, respectively, whereas the largest numbers captured in any year at any of the other sites were only 3992 in Miramar in 1979 and 4011 in Las Cumbres in 1976. On BCI two traps were used as compared to only one trap each at all other sites. On BCI the traps were operated all night, as they were in Las Cumbres and Boquete, but not at the other sites. However, these differences alone seem insufficient to explain the large between-site differences in species diversity. Obviously, BCI is an area much richer in weevils than any of the other sites. The second richest area may be Corriente Grande, where 259 species were collected in only four months. The area with the lowest number of species, on the other hand, is undoubtedly Guadalupe Arriba, at 2200 m altitude, with only 51 species collected in 20 months. The values for the diversity index α, with their standard deviations, and the mean α per year, where appropriate, are given in Table 4. The fact that the α for a site with the years combined was higher than the average α per year demonstrates a between-year heterogeneity in species composition, and the huge value of α (351.6) found when combining all sites, points to an enormous between-site heterogeneity in species composition (see below).

The distribution of species abundances at each site is summarized in Table 5. Not many species were common, as illustrated by the fact that 28% (BCI) to 51% (Corriente Grande) of all species collected were represented by only one specimen. On BCI only 31% of the species were represented by 10 or more individuals, and at the other sites only 11.8%–15.8% equaled or exceeded this number. Nevertheless, some taxa were very common, especially the *Phyllotrox* complex at BCI and Miramar. The three most common taxa at each site had between 25% and 75% of all individuals collected, and at BCI and Miramar the single commonest taxon was represented by 45% and 65% of all individuals. To test the formal validity of the α diversity index, the distribution of species abundances was tested against the expected distributions according to the logseries. The abundances were classified in "x3-classes," that is, class boundaries were multiplied by three, starting with the lowest boundary at 0.5. Class 1, then, is between boundaries 0.5 and 1.5 (1 individual), class 2 between 1.5 and 4.5 (2–4 individuals), class 3 between 4.5 and 13.5 (5–13 individuals), etc. The actual and the logseries distributions for the weevils from BCI are compared in Figure 3, demonstrating the large differences that are highly significant ($X^2(7) = 337.0$,

TABLE 5.—The number of species with only 1, at least 5, and at least 10 individuals as percentages of the total number of species. The number of individuals in the combined three most common species at each site is expressed as a percentage of the total number of individuals, as is the number of the single most common taxon.

Locality	% Spp. 1 indiv.	% Spp. ≥5 ind.	% Spp. ≥10 ind.	% Indiv. 3 Common	% Indiv. Commonest	Commonest taxon
Barro Colorado Island	28.0	42.0	31.0	61.46	45.30	Phyllotrox complex
Las Cumbres (CWOB)	38.9	26.9	15.1	27.90	12.35	Phyllotrox complex
Miramar	49.4	21.8	11.8	79.22	65.23	Phyllotrox complex
Corriente Grande	51.0	21.2	12.7	25.71	14.44	Terioltes sp. #1
Boquete	47.6	24.3	14.2	22.21	7.54	Micralcinus sp. #1
Fortuna	45.0	24.4	15.8	29.53	11.83	Micromimus continuus
Guadalupe Arriba	43.1	25.5	15.7	47.31	28.39	Cossonus sp. #5

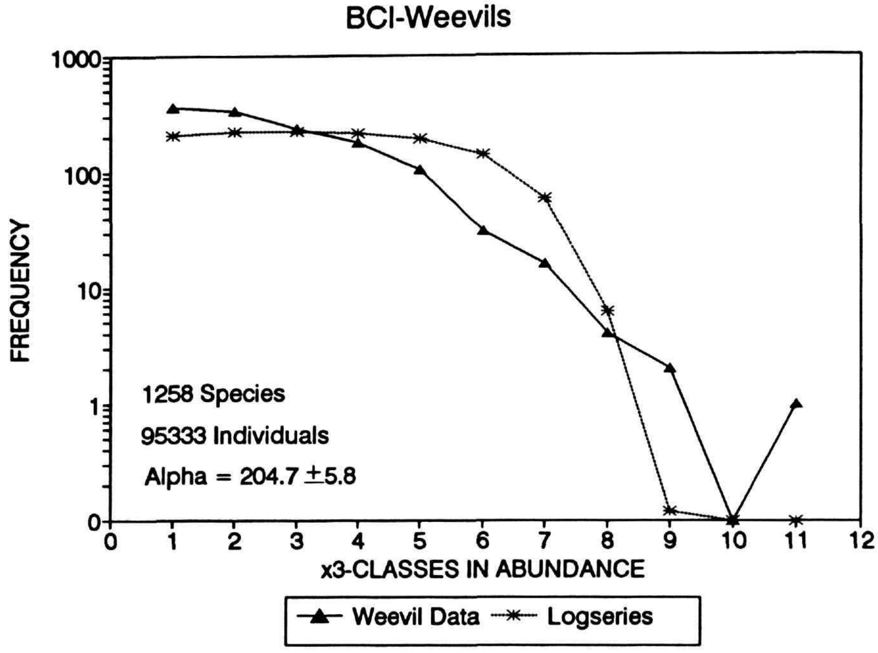


FIGURE 3.—Distribution of abundances of weevils (Curculionoidea) collected in light traps on Barro Colorado Island, as compared with the logseries distribution.

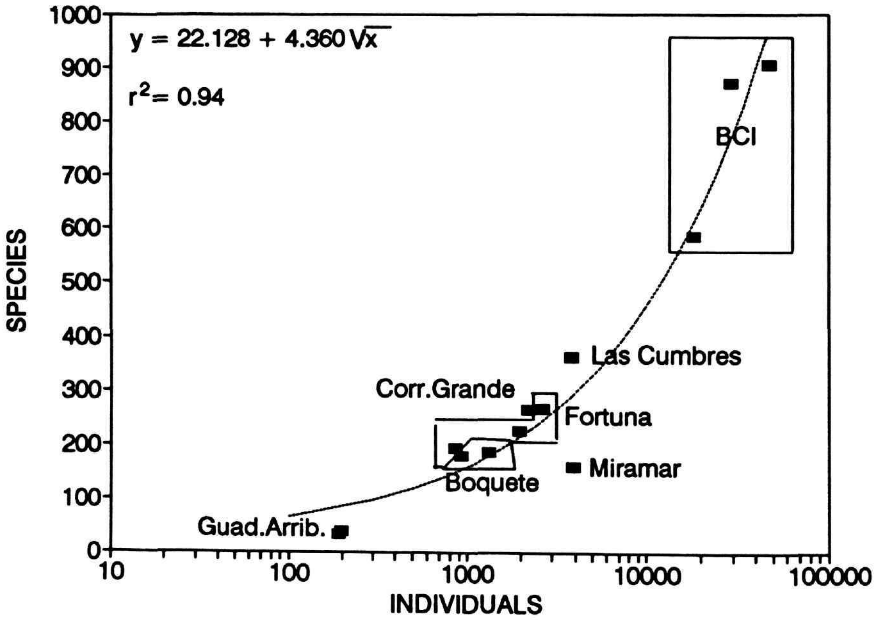


FIGURE 4.—Relationship between number of species and number of individuals of weevils (Curculionoidea) caught in light traps in each year at seven Panamanian localities.

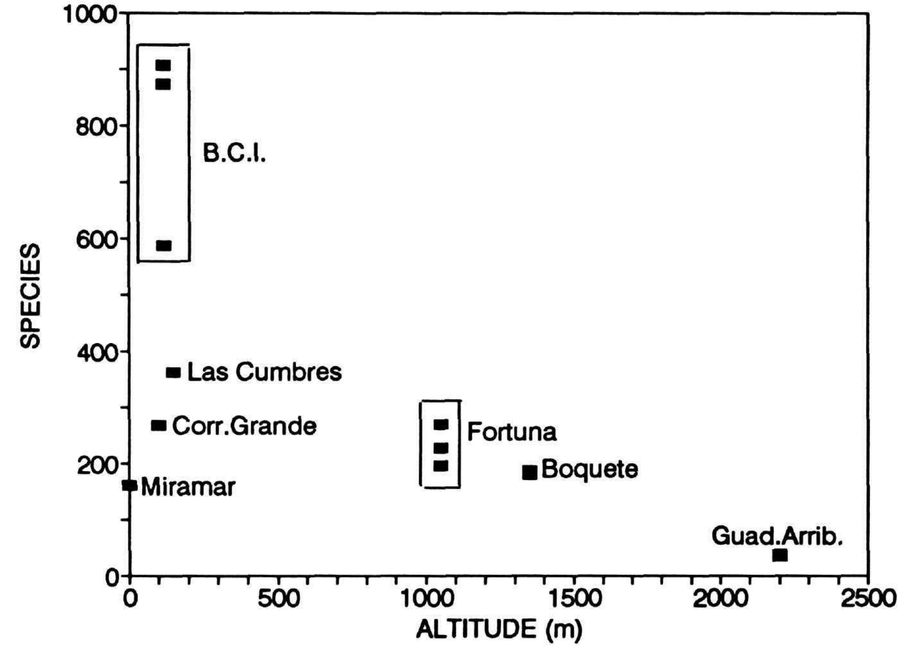


FIGURE 5.—Relationship between altitude and number of species of weevils caught by light traps in each year at seven Panamanian localities.

$p \ll 10^{-10}$). Compared with the logseries distribution, far too many rare species, represented by only one or two individuals, and far too few species of intermediate abundance were found. This means that interpretation of the actual values of the α-indices found must be done carefully. However, the deviation from the logseries at all sites was in the same direction as for BCI and was highly significant, except for Guadalupe Arriba where no statistical significance could be expected with the low numbers available. The α-index, therefore, can still be used to compare years and sites. The actual relationship between the number of species and the number of individuals in each year at each site is plotted in Figure 4, showing again the richness of the weevil fauna on BCI and the relative poverty of the weevils from Miramar and, especially, from Guadalupe Arriba. In terms of both numbers of individuals and species, Corriente Grande was at least as rich as Fortuna, in spite of the fact that insects were collected there for only four months. The lowest value at Fortuna was for nine months in the canopy, the other two points for this site each represent a full year of collecting at a near-ground level. A five-year study on Homoptera at BCI (Wolda, 1987) showed that canopy traps tended to collect more individuals but fewer species than did traps in the understory. The same was true for weevils at all the sites (see below), except at Fortuna. The lowest numbers for BCI was for the first year with a different chemical trap environment and well before the *Tachygalia* tree, from which the traps were suspended, started flowering (see above). Part of the differences between sites may have been due to differences in altitude (cf. Wolda, 1987). There was a significant decrease in species richness with increasing altitude (Figure 5, $p = 0.009$), but this was due mostly to the points representing the rich fauna at BCI. Without the BCI data the relationship was still significant ($p = 0.014$) but was almost exclusively due to the data from Guadalupe Arriba, suggesting that an altitude effect for weevils was not found from lowlands to intermediate altitudes, but was found only when higher elevations were included. Essentially the same picture was obtained with the relationship between individuals or α against altitude (data not shown). Part of the decrease in diversity with increasing altitude in these light-trap samples is undoubtedly due to a decreasing diversity of the fauna that was sampled, but part of it also may be related to the lower temperatures (Figure 2), and an associated decreased flight activity, at higher altitudes.

PER WEEK AND PER DAY.—All of the above discussion was about the diversity of samples representing entire years. However, within each year, diversity, whether expressed as species richness or as the diversity index α, is far from constant. This is illustrated for BCI in Figure 6. For some weeks the value of α was omitted because it was meaningless in such small samples. For instance, with four individuals and four species in a particular week, α reached the ridiculously high value of 264. In one instance (early May, 1977), α also reached an extremely high value of 275, which was based on a sample

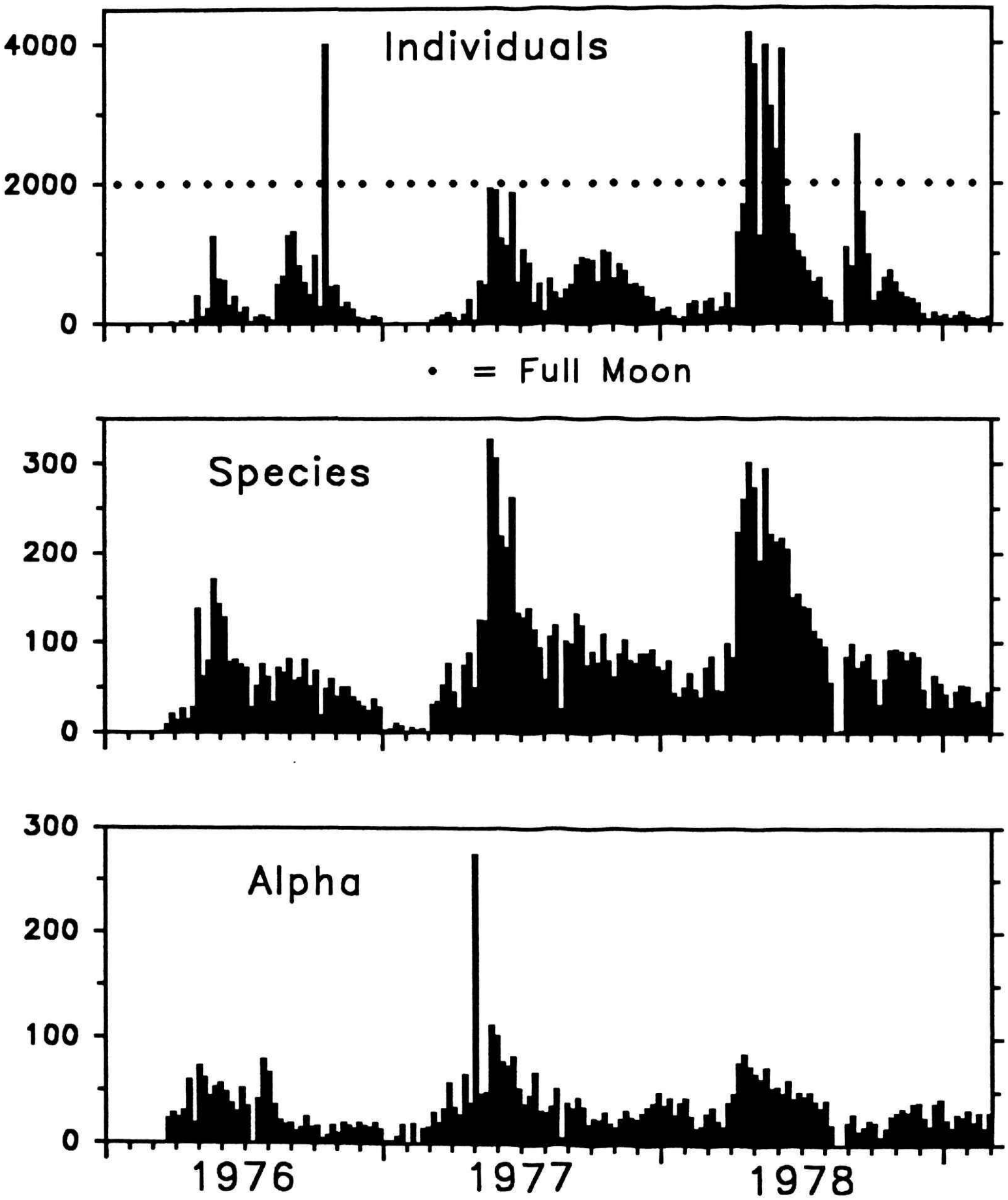


FIGURE 6.—Diversity (individuals, species, and alpha) per week over three years in light-trap samples collected on Barro Colorado Island, Panama (timing of full moon also indicated).

of 56 individuals and 51 species. We were inclined to omit this value too, but with this sample size such an omission would not be justified, and it is included in Figure 6. Both species richness and the diversity index α had a strong maximum in May–June, at the beginning of the rainy season, and then the number of species gradually tapered off toward a low in the dry season, especially January through March. There were weeks during which about 300 species were collected, as well as weeks when none or almost none were taken. There is a highly significant curvilinear relationship between the number of individuals and

TABLE 6.—Number of species and number of individuals in each family and subfamily of weevils at seven Panamanian localities. (The Las Cumbres data are for 1976 only.)

Taxon	BCI		Las Cumbres		Miramar		Corr. Grande		Boquete		Fortuna		Guad. Arr.	
	Spp.	Indiv.	Spp.	Indiv.	Spp.	Indiv.	Spp.	Indiv.	Spp.	Indiv.	Spp.	Indiv.	Spp.	Indiv.
ANTHRIBIDAE	80	775	9	17	2	4	1	1	3	4	3	5	0	0
APIONIDAE	40	1444	13	18	13	26	6	11	12	39	9	59	0	0
ATTELABIDAE	9	127	1	1	1	1	2	2	5	9	3	4	1	2
BRENTIDAE	68	8485	11	73	10	57	14	31	11	31	12	96	0	0
CURCULIONIDAE														
ANTHONOMINAE	31	932	7	9	5	6	1	1	5	14	3	5	0	0
BARIDINAE	19	137	3	3	1	1	12	57	6	6	14	24	6	73
CAMAROTINAE	1	1	0	0	0	0	0	0	0	0	0	0	0	0
CERATOPODINAE	13	283	1	2	5	12	1	1	7	25	7	25	0	0
CEUTORHYNCHINAE	1	2	0	0	0	0	1	1	0	0	0	0	0	0
COSSONINAE	47	6157	10	461	16	486	44	846	15	400	21	2198	2	114
CURCULIONINAE	2	8889	2	138	1	3	1	7	0	0	0	0	0	0
CRYPTORHYNCHINAE	440	8356	160	740	57	162	78	307	75	550	121	844	9	12
DRYOPHTHORINAE	3	30	0	0	2	15	4	210	0	0	2	525	1	3
ENTIMINAE	1	2	2	8	0	0	0	0	0	0	0	0	0	0
ERIRRHININAE	33	46759	11	776	7	3044	9	579	9	104	14	398	6	75
EUGNOMINAE	2	13	3	14	2	7	1	1	0	0	0	0	0	0
HYPERINAE	2	61	2	7	1	1	0	0	1	1	0	0	0	0
MAGDALIDINAE	1	2	0	0	0	0	0	0	0	0	0	0	0	0
MOLYTINAE	244	9202	101	1467	30	116	33	67	77	905	162	1017	17	88
OTIDOCEPHALINAE	16	58	2	2	1	1	4	4	0	0	1	1	0	0
PETALOCHILINAE	1	3	1	23	0	0	0	0	0	0	0	0	0	0
POLYDROSINAE	15	77	2	86	2	14	0	0	5	13	11	45	0	0
PRIONOMERINAE	7	13	1	2	2	4	0	0	2	2	2	3	0	0
RHYNCHAENINAE	0	0	0	0	0	0	0	0	0	0	1	1	1	1
RHYTIRRHININAE	0	0	1	57	1	13	0	0	0	0	0	0	0	0
RHYNCHOPHORINAE	11	1380	3	56	2	8	7	24	4	58	11	142	0	0
TYCHIINAE	4	28	2	4	0	0	0	0	1	1	0	0	1	6
ZYGOPINAE	148	2117	9	47	9	11	40	79	29	94	39	108	7	17
TOTAL	1239	95333	357	4011	170	3992	259	2229	267	2256	436	5500	51	391

the number of species ($r^2 = 0.676$, $n = 155$) and a significant linear correlation between the number of species and α ($r^2 = 0.301$, $n = 150$). In fact, there were times when about 200 species were collected in a single day (see below, Figure 12), whereas on other days no weevils were caught. The phases of the moon often have a strong effect on light-trap catches of insects, the numbers of individuals and species being reduced at full moon. The weevils as a group, however, seem at best only to be weakly sensitive to the phases of the moon (Figures 6, 11, 12), and many species may not be subject to effects of the moon at all. Based on these data, diversity varied strongly seasonally, but not at all or very little with the moon cycle.

FAMILIES AND SUBFAMILIES.—The weevils collected belonged to five families and, within the Curculionidae, to 24 subfamilies (Table 6). The large number of individuals in the Erirrhininae belonged mostly to the composite taxon "*Phyllotrox* complex" (Table 2), which was the most abundant taxon at BCI, Las Cumbres, and Miramar (Table 5). The Cryptorhynchinae and Molytinae were by far the most species-rich groups at all sites. The next most species-rich groups were the Zygopinae at BCI, Boquete, and Fortuna, and the Cossoninae at Miramar and Corriente Grande. At the other extreme, Magdalinidae were represented by only one species at one site. On BCI there were relatively many species of both Anthribidae and Brentidae, far more than at any of the other seven localities. The low numbers of Camarotinae were in all probability mostly due to a failure to recognize these flat leaf-miners as weevils when these light-trap samples were sorted, as they were found in greater numbers in samples from later years from these same traps on BCI (Barría, pers. comm.).

BETWEEN-SITE DIVERSITY.—Between 30% and 69% (average 50%) of all species caught at a site were not collected at any of the other sites (Table 7), 18%–47% of the species were shared with only one other site, and only 1.9% (BCI) to 20% (Miramar) of the species found at one site were found also in three or more other localities. Only the *Phyllotrox* "complex" was found at all sites, and these probably were different species in different sites in most cases. Table 8 contains the number of

TABLE 7.—Percent of species from each locality occurring at one or more of the other sites.

Locality	Total species	Restricted to site	Shared with only 1 site	Shared with only 2 sites	Shared with only 3 sites	Shared with only 4 sites	Shared with only 5 sites	Shared with all 6 sites
Barro Colorado Island	1239	64.3	25.2	4.5	1.4	0.25	0.25	0.05
Las Cumbres (CWOB)	357	30.5	47.3	15.4	4.2	0.84	1.40	0.28
Miramar	170	32.4	30.6	17.1	13.5	2.94	2.94	0.59
Corriente Grande	259	40.2	32.1	14.7	9.3	1.5	1.93	0.39
Boquete	267	49.4	25.5	17.2	4.5	1.1	1.87	0.37
Fortuna	436	58.7	23.5	11.6	3.6	1.1	1.11	0.23
Guadalupe Arriba	51	68.6	17.7	7.8	3.9	0	0	1.96

TABLE 8.—Number of species shared between seven Panamanian localities, as shown by light-trap samples. (BCI = Barro Colorado Island, LC = Las Cumbres, 1976, MIR = Miramar, CGR = Corriente Grande, BOQ = Boquete, FORT = Fortuna, GUA = Guadalupe Arriba.)

Locality	Number of species						
	BCI	LC	MIR	CGR	BOQ	FORT	GUA
Total species	1239	357	170	259	267	436	51
BCI	-	239	87	103	88	110	4
LC		-	45	33	26	23	1
MIR			-	50	19	27	2
CGR				-	29	58	5
BOQ					-	73	4
FORT						-	13

species shared between each pair of sites. All sites but Guadalupe Arriba shared more species with BCI than with any other site; Guadalupe Arriba shared more species with Fortuna. A better indication of the between-site diversity, however, is given by the matrix of NESS similarity indices (Table 9). The between-year, within-site indices were between 0.90 and 0.95. These values were high, but still significantly different from unity, pointing to real between-year differences in species composition. The between-site comparisons, however, yielded much lower index values, emphasizing again the high degree of endemism referred to above (Table 7). The highest among these low values were between BCI, Las Cumbres, and Miramar, the two Atlantic sites and the one Pacific site that does not have a highland barrier with the Atlantic side of Panama. The third Atlantic site, Corriente Grande, also tended to be more similar to these three sites than to the remaining sites with the exception of Fortuna. Fortuna had the highest similarity with Boquete, another highland site only 20 kilometers away, albeit in a very different ecological and climatological situation, and with Corriente Grande. Guadalupe Arriba had extremely low similarity values with all other sites, which in part may have been an artifact caused by the low numbers found at this site. Thirteen of the 52 species found there also occurred at Fortuna, suggesting a higher affinity between these sites than the NESS index suggests.

TABLE 9.—Within- and between-site diversity in Panamanian weevils as expressed by the NESS-similarity index and its standard deviation. For Las Cumbres, the within-site comparison is between the first two years, identified by H.P. Stockwell, and the between-site comparison is for the last year, identified by C.W. O'Brien. For Fortuna, only the two years with the trap at a low level were considered; for Guadalupe Arriba, the second year was only 8 months long.

	BCI	Las Cumbres	Miramar	Corr. Grande	Boquete	Fortuna	Guadalupe Arriba
Within Site:							
yr.1 vs. yr. 2	0.917 ± 0.003	0.919 ± 0.007	-	-	0.907 ± 0.015	0.899 ± 0.009	0.946 ± 0.034
yr.2 vs. yr.3	0.902 ± 0.003	-	-	-	-	-	-
yr.1 vs. yr.3	0.892 ± 0.003	-	-	-	-	-	-
Between Sites:							
BCI	-	0.378 ± 0.005	0.469 ± 0.004	0.281 ± 0.010	0.148 ± 0.010	0.168 ± 0.006	0.035 ± 0.019
Las Cumbres		-	0.384 ± 0.008	0.236 ± 0.009	0.172 ± 0.012	0.116 ± 0.005	0.027 ± 0.015
Miramar			-	0.359 ± 0.012	0.161 ± 0.013	0.194 ± 0.008	0.038 ± 0.020
Corr. Grande				-	0.152 ± 0.010	0.246 ± 0.011	0.026 ± 0.011
Boquete					-	0.240 ± 0.011	0.009 ± 0.004
Fortuna						-	0.058 ± 0.017

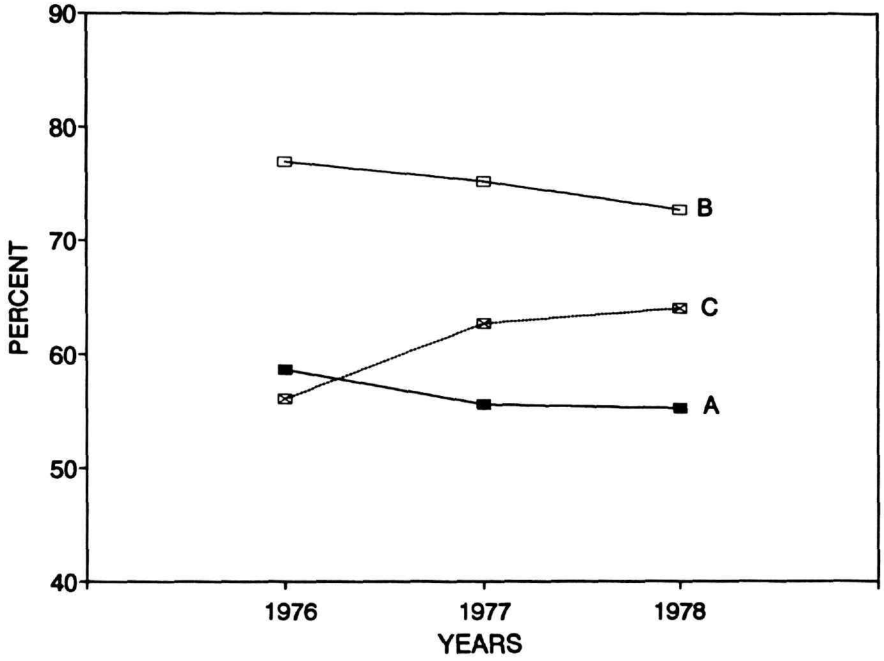


FIGURE 7.—Vertical distribution of weevils in forest on Barro Colorado Island as revealed by light traps: A, percentages of individuals found in canopy trap in each of three years; B, percentage of all species found in trap at ground level; C, percentage of all species found in trap in canopy.

CANOPY VS. GROUND LEVEL.—One BCI trap was located two to three meters above the forest floor and the other was in the canopy of a tall tree. The weevil faunas occurring at these two places conceivably could be very different, so that an analysis of differences in catches between the two traps might be rewarding. However, the canopy trap was visible from a fair distance and from below, whereas the low trap was less visible from the canopy. Thus, some possible habitat differences between canopy and ground level may be less evident in the trap catches.

In each of the three years on BCI, between 55% and 59% of the individuals were caught in the canopy (Figure 7). Fifty-six percent to 64% of the species were collected in the canopy trap, whereas 73% to 77% were found in the trap at ground level. Because of the large number of species common to both traps, the percentages recorded for the two traps totalled more than 100%. The distribution of the species, according to the percentages found in the canopy trap for all three years combined, is given in Figure 8. Species that had more than 10, more than 50, or more than 100 individuals are indicated separately. There obviously is a large variation among the species in vertical distribution, in common species as well as in rarer species. The NESS-similarity index, comparing the catches at the two levels for all three years combined, was 0.884 ± 0.002. This figure is high but is still significantly lower than the between-year values (Table 9), showing that between-level differences are larger than those between years. Of the 106 species in 1976 represented by more than 10 individuals, 16 species had none and five had all individuals in the canopy trap. Of the 213 such species in 1977, these numbers were 14 and 15, respectively; of the 231 such species in 1978, the numbers were 21 and 26, respectively. This suggests some tendency for some species to be restricted to one forest stratum or the other. For the 23 species in 1976 represented by at least 50 individuals, three species had zero and none had all individuals in the canopy; of 58 such species in 1977, five had none and three had all individuals in the canopy; in 1978 these numbers among 61 species were two and two, respectively. So even in these common species, only a few were restricted to either the canopy or to a low level in the forest. There are differences between what was caught at the two levels, but these are not spectacular and there is nothing in the present data that points to a mythical special fauna in the canopy. If there is a special fauna of weevils in the canopy, the species involved either do not come to light or they come to both the canopy and the low trap.

For most species the vertical distribution in the forest was consistent from year to year. The fraction in the canopy is given in Figure 9 for all species that had at least 50 individuals both in 1977 and in 1978. Graphs made for the other between-year comparisons were similar. The vast majority of the species clustered around the diagonal showing between-year consis-

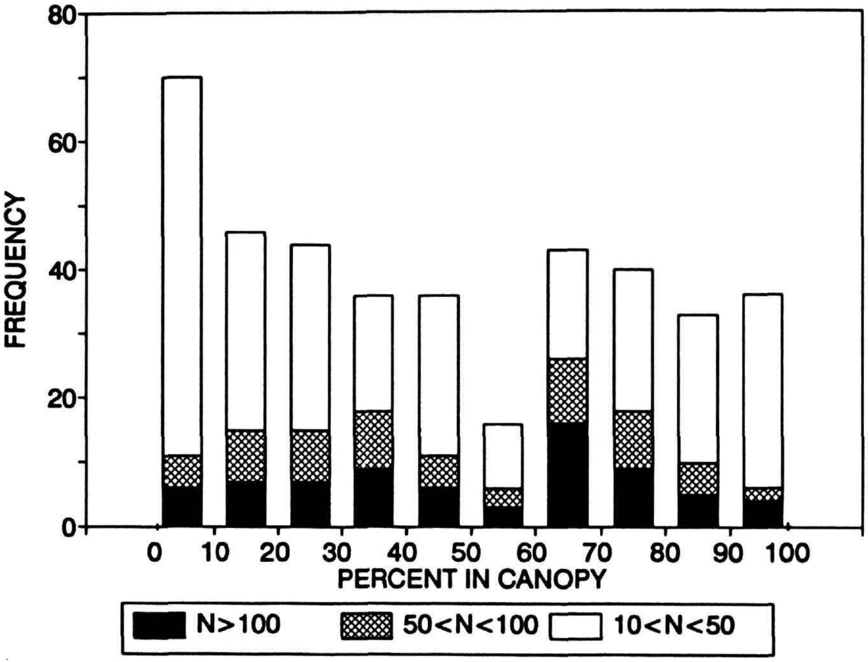


FIGURE 8.—Distribution of percentages of all individuals of common species of weevils found in canopy trap on Barro Colorado Island, all three years combined.

tency, but a few did not. For these there was a much higher fraction in the canopy in 1978 than in 1977. Three of these species also were represented by more than 50 individuals in 1976. For two of these, the percentages in 1976 were identical to those in 1977 (*Paratrachelizus* complex (1) 0% (N = 50 and 82) both in 1976 and 1977 and 37.8% (N = 189) in 1978, *Isotrachelus tibialis* (3) 51.8% (N = 139) in 1976, 51.7% (N = 209) in 1977 and 100% (N = 159) in 1978), whereas for the third species (Cryptorhynchinae sp. #C-66 (4)) 1976 was similar to 1978 (80.3% (N = 369) in 1976, 6.8% (N = 148) in 1977, and 73.1% (N = 725) in 1978).

DISCUSSION OF DIVERSITY

SPECIES RICHNESS IN PANAMA COMPARED WITH NONTROPICAL AREAS.—Weevil collectors usually do not consider light traps to be an effective tool and overwhelmingly prefer other methods, such as beating or sweeping. For instance, even when the light source is optimized with respect to the spectral sensitivity of the eyes of the weevil concerned, the light trap is not considered useful as a survey tool for *Diaprepes abbreviatus* (L.) (Beavers et al., 1979). The ineffectiveness of the light trap also is recognized by weevil collectors in the neotropics (CWOB, HPS, unpublished data). A comparison of light-trap data in the present study with the results from other collecting methods shows the strong selectivity of light-trap samples. Locally rich and diverse groups, such as the Baridinae and Polydrosinae, are poorly represented in the light traps. For instance, a little over one-half of the 343 known Panamanian species of Cryptorhynchinae (CWOB, unpublished data) are represented in our light-trap samples, as compared with about one-third for Molytinae and Zygopinae. On the other hand, in the subfamilies Polydrosinae and Baridinae the percentages represented are 12.1 and 5.1, respectively. In forest and woodland habitats, light traps seem to be much more effective in collecting woodborers than in collecting other groups. These woodboring weevils attack dead or dying wood. Species of the family Cerambycidae that attack dead wood do come to light, whereas species of Cerambycidae that attack live wood do not. It is not clear why there is a correlation between attraction to light and the type of substrate attacked. It is also unknown whether such a correlation exists among weevils. Overall, it is estimated that only 25% to 40% of the weevil species present were collected at light. Of the 1666 species in the list of known Panamanian species (CWOB, unpublished data), 612 (36.7%) were represented in our samples (the other species we collected are unidentified, see "Appendix"). The light-trap project reported on herein was actually designed to collect insects other than weevils. Yet in the tropical environment in Panama, the catches of the weevils were surprisingly large, with thousands of individuals being collected per year in all lowland sites and even in most years at intermediate altitudes in the mountains.

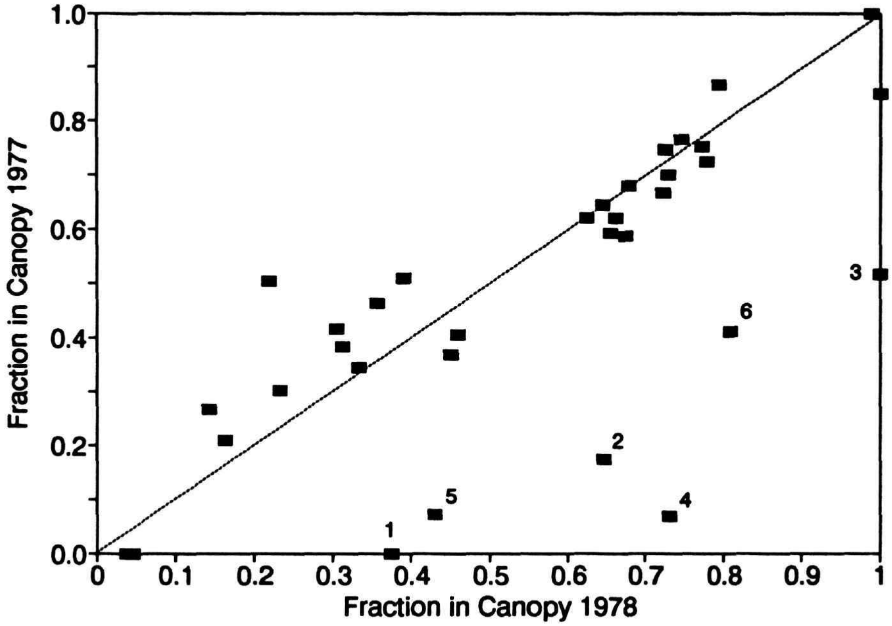


FIGURE 9.—For all species of weevils with at least 50 individuals in each of the two years 1977 and 1978, fraction of those individuals found in canopy in 1977 plotted against that fraction in 1978. Six species that were rather different in the two years were (1) *Paratrachelizus* complex, (2) *Pseudoanthonomus tachyon* Clark, (3) *Isotrachelus tibialis* (Champion), (4) Cryptorhynchinae sp. #C-66, (5) *Caulophilus* sp. #7a, (6) *Conotrachelus punctiventris* Champion.

Only at higher altitudes did sample size decrease dramatically. Also, the average number of species per year varied from 36 at Guadalupe to 788 at BCI.

We are not aware of any analysis of light-trap samples of weevils from temperate areas. Most colleagues who work with light traps in the temperate zone tell us that their traps collect very few weevils (Witkowski, pers. comm.; Spitzer, pers. comm.). However, samples taken by other methods, such as sweep-nets, are reported in the literature, especially from eastern Europe. The contrast in species richness between those samples and the Panamanian light-trap samples is striking. In a Danish beech forest, the total number of species obtained over a period of up to three years, using a variety of collecting methods, was only 29, with only 11 to 14 species per year obtained with any one method (Overgaard Nielsen, 1974a). In the understory of a woodland in England (Phillips, 1992), the total number of species collected was 28, varying from one to 23, whereas in southern England Owen (1993) found 34 species of weevils. The Polish studies yielded somewhat more species, with a total of 128 species taken over a period of three years at 13 sites near Zabierzów (Witkowski, 1975) and varying per year per site from three to 35 (average 21). In five sites in two nature reserves south of Katowice, the number of species varied between 57 and 84 (Kuśka, 1982), and among 13 sites in the western Tatra Mountains of Poland (Knutelski, 1993), the total number of species was 83, varying per site between nine and 41. In the Ojców National Park in Poland, the number per collecting method per year was 25 (13–39) (Witkowski, 1969). Other Polish sites had similar species numbers (Cmoluch, 1962, 1971; Cmoluch and Kowalik, 1963; Cmoluch et al., 1975; Jankowska and Witkowski, 1978; Witkowski, 1978, 1979; Petryszak, 1981, 1987, 1988; Witkowski and Mazur, 1983; Knutelski, 1988, 1991; Petryszak and Kaczmarczyk, 1992). Among nine sites and eight tree species in Slovakia, a total of 108 species was found, ranging from 13 to 50 species per site (Holecová, 1991a, 1991b, 1991c, 1993a, 1993b, 1993c), whereas sweeping four sites in oak-hornbeam forests in the same area produced 44 to 73 species (Holecová, 1993d). The number of species collected by shaking in seven forests near Moscow (Roginskaya, 1992) varied from 10 to 25, with a total of 30 species. The sweep samples taken in 54 Finnish sites contained 88 species in total, varying between sites from 0 to 37 (Raatikainen and Iivarinen, 1986). Weevils collected in Japan using beating methods varied by location. Only six species were caught in a forest (Isono et al., 1986), whereas on the Japanese Izu Islands the number of species per island varied between 16 and 54 (Morimoto and Miyakawa, 1985). In three years of pitfall-trapping, the total number of weevil species collected in the Orange Free State, South Africa, was 52, at the rate of 33 to 38 per year (Louw, 1987). The poorest Panamanian site, Guadalupe Arriba at 2200 m altitude, still compares favorably with the richer of these temperate areas. The total number of species collected in the entire Kraków uplands in south Poland, since 1866, was 574 (Mazur, 1983), and the total number of weevil species recorded for the British Islands is 520 (Owen, 1993). The total number of species collected in Panama, on the other hand, far exceeds the 2030 species (Table 4) discussed in the present paper (CWOB, unpublished data; HPS, unpublished data). Only 30.1% of the species from our traps are known (described) species, and the total number of described species from Panama is presently estimated as 1666 (CWOB, unpublished data), which suggests that the total number of weevil species present in Panama may be over 5000. In contrast, in 1971 a total of only 2388 weevil species were known from the entire Nearctic (O'Brien and Wibmer, 1978).

The number of species found depends on sample size, so a diversity index that is more independent of sample size may provide a more useful measure of the richness of a fauna. The diversity index α for the Danish samples varied between 0.73 and 1.79, with a value of 2.70 for all samples combined. For the British samples (Owen, 1993), α was 5.60. The Polish samples had an average α of about 16, varying between four and 39, and the three Slovakian sites had an average α of 12 (9.9–13.8). The 51 Finnish samples for which α could be calculated had an average of 7.01 (3–14.3), the seven Russian samples had an average of 2.07 (1.26–3.26), the nine samples from the Izu Islands (Japan) had an average of 8.06 (4.19–10.35), and the α for the South African sample, three years combined, was 14.41 (12.3–14.4 per year). There was some variation in diversity between these temperate sites, but they were all far poorer than the Panamanian samples (Table 4), again with the exception of the low diversity of the high-altitude sample at Guadalupe Arriba, which was similar in richness to the richer of these extra-tropical sites. This extraordinary richness of the Panamanian samples occurred in spite of the fact that they were taken by light traps and thus represented only a small part of the total fauna, in contrast with the temperate samples that were obtained by sweeping and/or beating and thus were probably much more representative of the fauna as a whole.

Surprisingly, the weevils as a group did not show any clear depressing effect of the full moon on catches in the light traps (Figures 6, 11, 12). This is in sharp contrast with general collecting experience (CWOB, HPS). In other groups, such effects have been found in the tropics (Brown and Taylor, 1971), with the effect sometimes being very strong (Itô et al., 1993; Wolda, 1977) and sometimes rather weak (Banerjee et al., 1981; Banerjee et al., 1986), even among some insect groups from the same light traps on BCI with which the present weevils were collected (Wolda, 1977). The abundance of some insects did not show any correlation with the phases of the moon (Bandyopadhyay, 1975). The situation in the present weevil samples contrasts sharply with that in other insect groups, collected by the same light traps that obtained the weevil samples, in which strong moon-effects were obvious (Wolda, 1977).

FREQUENCY DISTRIBUTIONS OF SPECIES ABUNDANCES.—A useful model for the frequency distribution of abundances of species is the logseries on which the α-index is based. There does not seem to be a sound reason why natural communities should be built according to the logseries, but as in many studies the observed distributions did not differ significantly from the logseries, or were at least close to it, the logseries model provides a useful yardstick with which actual distributions can be compared. The distribution of the abundances of all Panamanian weevil samples was clearly different from that of the logseries (Figure 3). All differences were in the same direction, i.e., the samples contained far too many very rare species, too few species of intermediate abundances, and, if anything, too many very abundant species. This is in clear contrast with most temperate samples of weevils we know about (Witkowski, 1969, 1975; Overgaard Nielsen, 1974a; Petryszak, 1981, 1988; Morimoto and Miyakawa, 1985; Raatikainen and Iivarinen, 1986; Louw, 1987; Petryszak and Kaczmarczyk, 1992; Roginskaya, 1992; Knutelski, 1993; Owen, 1993.) Some of the temperate samples showed significant difference of one kind or another from the logseries, but in only a minority of these temperate samples was the deviation as described for the Panamanian samples. That minority included the samples discussed by Cmoluch (1971), Kuśka (1982), Witkowski and Mazur (1983), Knutelski (1988, 1991), Holecová (1991a, 1991b, 1991c, 1992, 1993a, 1993b, 1993c, 1993d), and Owen (1993), who all found an excess as compared with the logseries, often statistically significant, of species represented by only one individual, just as in the present Panamanian samples. Although the distribution of species abundances in the majority of temperate samples was different from the Panamanian samples, several other temperate samples were similar to the tropical ones, suggesting that there may be no basic difference in this distribution between tropical and temperate weevil faunas. At least the available information does not prove there was. Morse et al. (1988) found that as many as 58% of beetles collected by canopy fogging in a tropical lowland rainforest in Brunei were represented by only one individual. This was an even higher percentage than we found among the Panamanian weevils (Table 5) and seemed higher than would be expected from a logseries distribution. A distribution with many singletons can be obtained when single individuals of vagrant species become part of the sample (Taylor, 1978; Wolda et al., 1994). We believe this to be the case for the Panamanian weevils. The singletons may have been occasional immigrants from elsewhere, but they also could have been rare captures of local species that, because of their behavior, are not normally caught in light traps. The observed distribution of abundances of weevil species may have been partly due to the capture technique, but it is possible that peculiarities of a tropical weevil fauna were at least partly responsible. Many weevils are host specific or oligolectic (Janzen, 1980; Paulay, 1985; Knutelski, 1988; Anderson, 1993) and, therefore, may have been thinly distributed in a diverse rainforest with its large number of plant species. The abundance of rare species might be more common in tropical than in temperate faunas. However, Microlepidoptera collected at light traps in a variety of Brunei forests, ranging from mangrove through lowland to montane, had an abundance distribution that was a close fit to the logseries (Robinson and Tuck, 1993). This suggests that not all tropical insect groups, at least not at all sites, have this excess of rare species. Moreover, the fact that a number of weevil samples from temperate climates had the same excess suggests that whatever is the cause, it may be similar in Panama and in at least some temperate areas.

BETWEEN-YEAR COMPARISONS.—The between-year comparisons of the Panamanian weevil samples using the NESS similarity index (Table 9) provided a mean NESS value of 0.912, varying from 0.892 to 0.946. All these values were significantly different from unity, although the one from Guadalupe Arriba was only marginally so, showing that samples from different years do show some variation. Between-year comparisons for the samples from Denmark (Overgaard Nielsen, 1974a), Poland (Witkowski, 1969, 1975; Knutelski, 1991; Petryszak and Kaczmarczyk, 1992) and South Africa (Louw, 1987) gave similar between-year NESS values, reflecting the fact that between-year variations in abundance of insect species are similar in the tropics and in the temperate zone (Wolda, 1978, 1983b).

BETWEEN-SITE COMPARISONS.—There was obviously a high degree of endemism (Table 7), a large between-site (beta-) diversity, in these weevils as evidenced by the low similarity values (Table 9). This also had been found for other groups of Panamanian insects, such as cockroaches (Wolda, 1983a; Wolda et al., 1983), Psocoptera (Broadhead and Wolda, 1985), some Coleoptera (Chandler and Wolda, 1987), and Homoptera (Wolda, unpublished data). Unfortunately, there are not much data on weevils from elsewhere available to us to see whether or not these low values are commonplace or are, somehow, restricted to the tropics. Raatikainen and Iivarinen (1986) compared 54 sweep-samples taken in late June to mid-July for three years from hay meadows all over Finland. The between-site NESS for the 43 sites having at least 10 species was, on the average, 0.674 ± 0.155. The area covered was much larger than that in Panama, but the environments selected (hay meadows) were much more homogeneous. From southern Poland data are available from 11 localities and, in many cases, from different vegetation types within each locality (Witkowski, 1969, 1975; Petryszak, 1981, 1988; Kuśka, 1982; Witkowski and Mazur, 1983; Knutelski, 1988, 1991, 1993; Petryszak and Kaczmarczyk, 1992). The mean NESS for samples from different vegetation types within each locality varied between 0.244 and 0.619, with a mean of 0.45. The mean NESS value for the 11 localities, varying widely in altitude and habitat, with samples within each locality lumped, was 0.303, varying from 0.101 to 0.756. The average between-island NESS index for the Izu Islands in Japan (Morimoto and Miyakawa, 1985) was 0.505, varying between 0.305 and 0.727. The mean between-site similarity for Slovakian samples varied from 0.453 for samples from *Corylus* to 0.683 for samples from *Alnus* (Holecová, 1991a, 1992, 1993a, 1993b, 1993c), whereas between five biotopes, different sites combined, similarities varied between 0.169 (beech forest vs. xerothermic meadows) and 0.695 (mesophilic vs. xerothermic meadows) (Holecová, 1991b). On the other hand, the mean NESS value for the Panamanian samples in Table 9 is 0.186, varying from 0.009 to 0.469. This limited information strongly suggests that for weevils the tropical between-site similarities were smaller, i.e., the differences in species composition and relative abundances tended to be larger, than those observed in temperate areas.

The comparisons made here between the present Panamanian weevil samples and those from the temperate zone suffer from differences in collecting methods. All Panamanian samples were from light traps, whereas none of the European samples was collected in this way. However, the richness of the present tropical samples was not due to the collecting method employed. The Panamanian samples are so rich, not because light traps are so efficient for weevils, but because the neotropical weevil fauna is so rich. This is in line with the geographic distribution of the described weevil species (O'Brien and Wibmer, 1978), whereas the number of undescribed species in the Neotropics undoubtedly is vastly larger than those in the Nearctic or in the Palearctic (O'Brien and Wibmer, 1979). In fact, the majority of the species reported in the present paper (69.9%) are still undescribed.

VERTICAL STRATIFICATION.—On BCI more weevil individuals were collected in the canopy trap than at ground level, whereas the ground-level trap caught more species in each of the three years. The same pattern was found for Homoptera from the same traps (Wolda, 1987). The higher species richness at a low level in the forest for both insect groups was not expected. Some of the species, especially the ones rarely caught, could have been migrants from elsewhere, and one might expect this migration to have taken place predominantly at the canopy level, leading to a higher species richness here. The present results suggest, however, that our expectation concerning migration may have been wrong. There were clear-cut differences between the faunas caught in the canopy and those caught at ground level. The similarity index between these faunas was high, but still significantly lower than the similarity between years, showing that the differences between levels in the forest, though not very large, were larger than those between successive years. The vast majority of the species occurred at both levels, but some species, even very common ones, were found exclusively in the canopy or in the

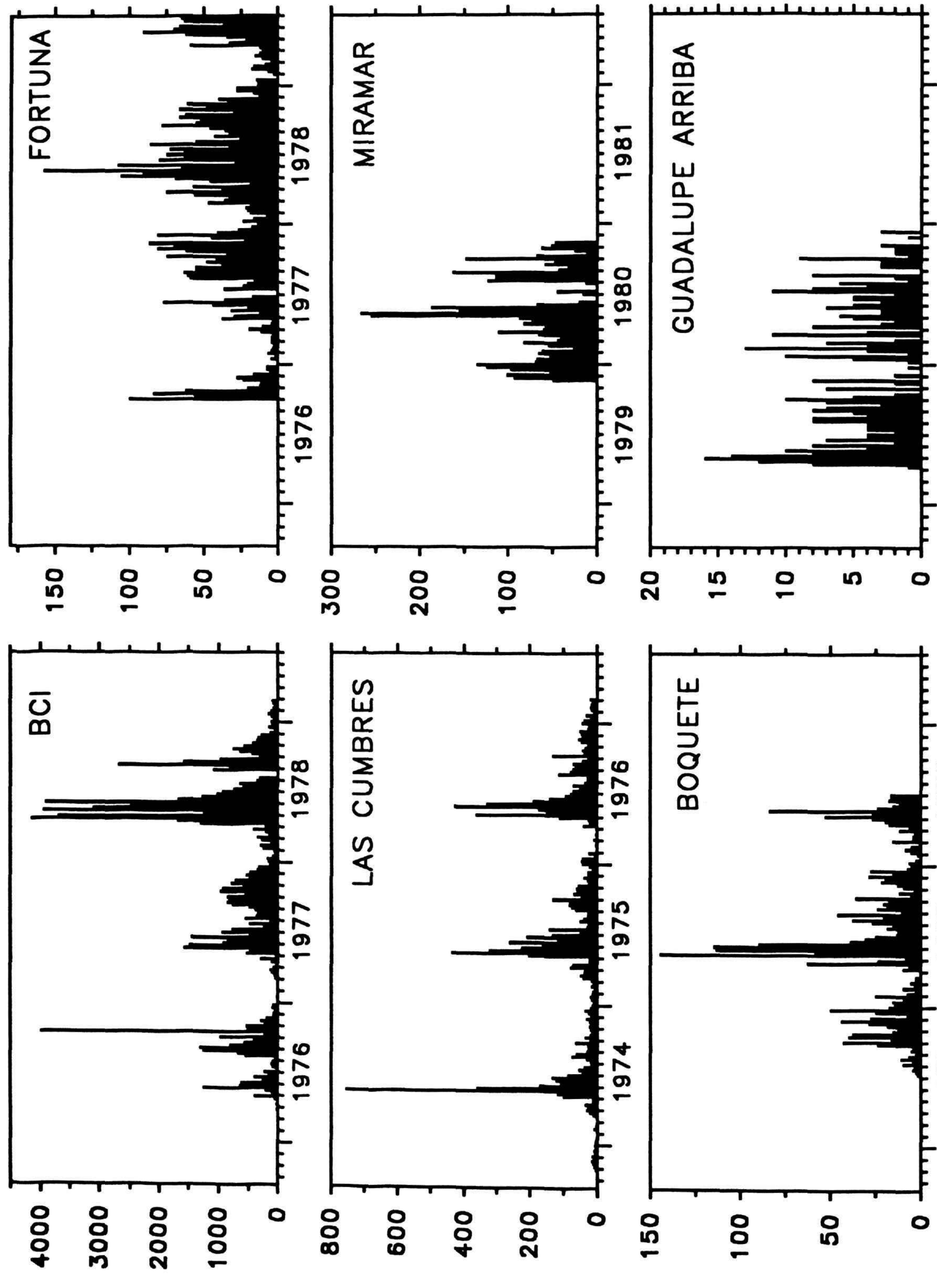


FIGURE 10.—Seasonal pattern of total number of weevil (Curculionoidea) individuals per week in six Panamanian localities.

low trap. The differences between the two levels were clear but not very large, and they do not suggest the existence of a fauna in the canopy that is vastly different from what is seen at ground level. Brown (1961) found suggestions of a vertical stratification among beetles in a forest in Uganda, and Hingston (1930) also marvelled at the differences in catches at different levels in a forest in Guyana. Most authors found that many more individuals were observed in the canopy than at lower levels in several insect groups, such as sphingid moths (Corbet, 1961a), male tabanid flies (Corbet, 1961b), or insects in general (Sutton and Hudson, 1980; Sutton et al., 1983; Basset et al., 1992). Our observations that both weevils and Homoptera were richer in species at a low level than in the canopy is, however, in contrast to studies by Corbet (1961a) and Basset et al. (1992), who found more insect species high in the forest, or Corbet (1961b), who found no vertical gradient in species richness in mosquitos. In our study, the vertical distribution of most species was consistent from year to year, but there were curious, as yet unexplainable, exceptions, even among some very common species (Figure 9).

We do not know the extent of the area from which weevils were attracted to the traps. We also do not have useful information on the dispersal distances of weevils. Beavers et al. (1979) reported that *Diaprepes abbreviatus* (L.) has a maximum single flight of 45 meters, whereas Solbreck (1980) showed that the pine weevil *Hylobius abietis* L. may migrate over a distance of many kilometers. Sufficient information along these lines is not available to make any kind of generalization, certainly not for tropical weevils.

SEASONALITY

WEEVILS AS A GROUP.—The seasonal distribution of all weevils summarized for each site, except Corriente Grande, is given in Figure 10. Data from Corriente Grande are ignored here as they cover only four months, which is insufficient for information on seasonality. The most seasonal sites, based on rainfall (BCI, Las Cumbres, and Boquete), also had the strongest seasonal patterns in terms of weevil abundance as determined by the light traps. Especially noticeable were the sharp to very sharp seasonal peaks at the beginning of the rainy season in May, with a second peak occurring around October, especially on BCI. Peaks in the other climatologically less seasonal sites were far less obvious, but seasonal patterns were still apparent. In Fortuna, there was an annual low in abundance in the early part of the year in spite of the absence of a distinct dry season, and a peak in abundance in May at what would be the beginning of the rainy season in more seasonal sites. In Miramar, there may have been a distinct low in abundance in June–July, but trap problems during part of that period make an interpretation of the results difficult. In the high-altitude site of Guadalupe Arriba, there was a seasonal low in abundance in November–December. For Miramar, only one year of data were available, so it is not known whether the possible low in June–July 1979 was a generally occurring phenomenon, and thus seasonal, or just an accident of that year. We favor the former explanation. The lows in abundance at the other sites, however, were repeated in successive years and were thus clearly seasonal. At the seasonal sites, the beginning of the rainy season seems to be a strong environmental clue for seasonal abundance patterns of weevils.

How closely weevil activity in general follows the onset of the rains is indicated in Figure 11 for individuals and Figure 12 for species at BCI by showing daily abundances over the three-month period that invariably includes the transition from dry to rainy season. In both 1976 and 1977, the dry seasons were unusually long and dry, especially in 1977, during a moderate El Niño event. In 1978, periods of rain often were followed immediately by large increases in abundance of both individuals and species. For weevils the rains on 17 April 1978 apparently provided an important seasonal cue. No such clear weevil responses were seen in the other years. In 1976, a heavy shower on 9 April was not accompanied by a change in weevil abundance, but the light showers in late April/early May did initiate weevil activity, as did the heavier rains in late May. In 1977, the first moderate flights of weevils were preceded by one light shower on 5 May and then weevil abundances increased in late May during and after some heavier rains. Rain did have a strong effect, but not if it occurred too early in the season, i.e., 10 April was too early in 1976, but 17 April was not too early in 1978. In late April or early May, any amount of rain seems to have had an effect. The full moon did not have a depressing effect at all on weevil catches in the light traps, at least during the period March through May.

BETWEEN-SPECIES COMPARISONS.—*Mean Vector:* General seasonal patterns of groups of species are only marginally informative, depending as they do on the kinds of species present at each site and their relative abundances. A study of the component species at each site is much more useful. Data for all complete years of collecting were combined, and only species represented by at least 10 individuals in those years were considered. For the Fortuna site, this meant that only the two years with the trap at ground level were included in the analysis, for Las Cumbres the data from October 1973 to March 1974 were excluded, and for Guadalupe Arriba the year chosen ran from April 1983 to April 1984. There was a wide variety of seasonal patterns among the species at each site, and presenting all those patterns individually is impractical. The data are best presented in summary form. The distribution of the degree of seasonality as expressed by the Mean Vector (r) is presented in Figure 13, where zero stands for a uniform distribution over the year and 1 means that all individuals were found in the same week. A large variation in the value of r was obvious at all sites. Whether or not the seasonal pattern of a species was significantly different from a uniform distribution depends both on the value of r and the number of datapoints (individuals). Nonsignificant cases are represented by the white columns, and

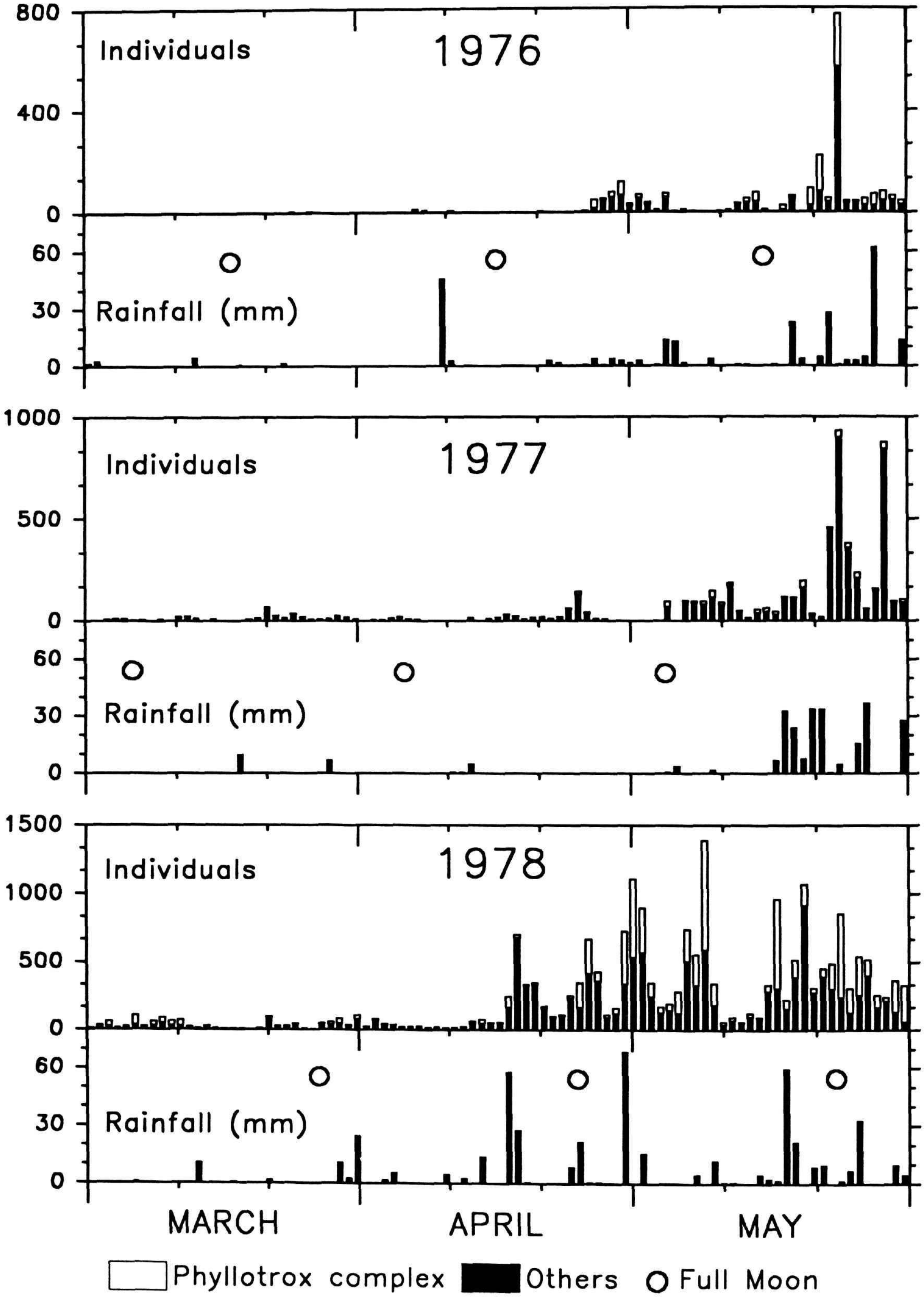

800
400
0
Individuals
1976
60
30
0
Rainfall (mm)
1000
500
0
Individuals
1977
60
30
0
Rainfall (mm)
1500
1000
500
0
Individuals
1978
60
30
0
Rainfall (mm)
MARCH
APRIL
MAY
Phyllotrox complex
Others
Full Moon

FIGURE 11 (left).—Daily catches of weevils over period March–May in three years on BCI, together with daily rainfall over those same periods. Commonest taxon *Phyllotrox* complex given separately from the rest of the weevils (timing of full moon also indicated).

significant seasonalities are represented by dark columns in Figure 13. The percentages of species that were significant were 84.5%, 87.5%, and 81.0% for BCI, Las Cumbres, and Boquete, respectively, whereas for the climatologically less seasonal sites, Miramar, Fortuna, and Guadalupe Arriba, these percentages were only 60%, 58.6%, and 62.5%, respectively. Las Cumbres appeared to be the most seasonal site with 24% of the species having r-values over 0.9. For BCI and Boquete, these percentages were 11.3% and 7.1%, whereas at the other three sites such high r-values did not occur. Mean values for r, given in Figure 13 with standard deviation and standard error, also illustrate these differences between the sites. Despite the correlation between the distribution of the mean vectors and the general climate, it is clear that even in the most aseasonal sites some species with short seasons (high mean vector values) do occur.

Mean Week and Peak Week: The Mean Week, i.e., the mean of the seasonal distribution, also was calculated for these weevil species, and the results are plotted in Figure 14, together with the mean and angular deviation for these plots. Only the species that were significantly different from uniformly distributed were included in the calculations of these mean vectors and angular deviations because the concept of Mean Week is not very meaningful for species whose distribution is not significantly different from uniform. The distribution of the Mean Week for those nonuniform species was not significantly different from uniform in Miramar and Guadalupe, but it was highly significant in the four other sites. In other words, in the former two sites some species may have had their mean week at any time of the year, whereas at the other four sites the mean weeks tended to be clustered in a certain season, which in all these cases was May to July. As expected, the nonsignificant species in these plots were distributed throughout the year with no apparent concentration. In spite of the distinct clustering, at virtually any time of the year some species could be found to have reached maximum abundance.The average of the significant Mean Weeks tended to occur in June (BCI, Las Cumbres, Fortuna) or July (Boquete), about a month later than the average Peak Week, the actual mode of the seasonal abundance, suggesting a skewness to the right in the seasonal pattern of many species. In order to properly study this skewness, the (principal axis) regression of Mean Week (y) on Peak Week (x) was calculated for all weevil species represented by at least 10 individuals and that had a seasonal distribution significantly different from uniform. The regression was, for all sites taken together, $y = 4.56 + 0.85x$ and the Jupp-Mardia circular correlation was $r^2 = 1.335$ with $N = 523$ ($p < 10^{-10}$). This regression was very close to the diagonal where Peak Week = Mean Week, so that Peak Week residuals were calculated by simply subtracting Mean Week from Peak Week, while making sure that no residual is larger than 26 weeks in this seasonal circular world. These residuals were plotted in Figure 15, for each site separately. No particular pattern was evident among the few species in either Miramar or Guadalupe Arriba, but in the other four sites many points occurred in a downward band, starting at a residual value of zero in May and becoming more and more negative as the points occurred closer to August. These species all had their time of maximum occurrence in May but had their Mean Week value later in the year, skewed to the right of the seasonal pattern. This is illustrated in Figure 16A-C. As is clear from these examples, this "skewness" often reflected bimodality. On BCI a second band of points was evident, starting in September with residual values around zero and going up and to the left, becoming more positive the closer the points are to June. These points represent species that had their maximum abundance late in the year but whose abundance patterns are skewed to the left, often with a secondary peak earlier in the season (Figure 16D,E). In fact, the seasonal pattern of the species in the top band tended to be similar to that of the species in the lower band, except that it was the later rather than the earlier peak that was the largest.

The Morisita index of seasonal diversity (Morisita, 1967; Yamamoto, 1974) was calculated for each species from BCI with at least 10 individuals over three years and was plotted against the Mean Vector for those species in Figure 17. A higher degree of seasonality is indicated by a higher value for the Mean Vector and by a lower value for the index of seasonal diversity, so that the relationship between the two is expected to be negative. The correlation coefficient between the two measures of degree of seasonality is highly significant ($r = -0.624$, $p \ll 0.001$) but is far from perfect, showing that the two measures are far from identical. We prefer the use of the Mean Vector.

BETWEEN-YEAR WITHIN-SITE COMPARISONS.—As was shown above, many species at all sites had patterns of variation in abundance over the year that were significantly different from uniform. For most sites these patterns were based on the combined abundance data of more than one year. Similarly, within each year, the majority of species showed significant abundance variation, but the question is whether or not species in different years at the same site showed the same variation in abundance over the year. In other words, was the variation in observed abundance cyclical and did it reflect true seasonality, or was it just variation that had little or nothing to do with climatic seasonality, which was shown for mosquitos in northwestern Panama (Wolda and Galindo, 1981)? In four of the sites with between-year information on weevils (BCI, Las Cumbres, Boquete, and Fortuna), comparisons were made using the Mean Vector, i.e., the indicator of the degree of seasonality, and the Mean Week, i.e., the mean of the annual distribution. For each species of which at least 10 individuals were collected in each of the years, these measures were calculated per year and then the average and standard deviation

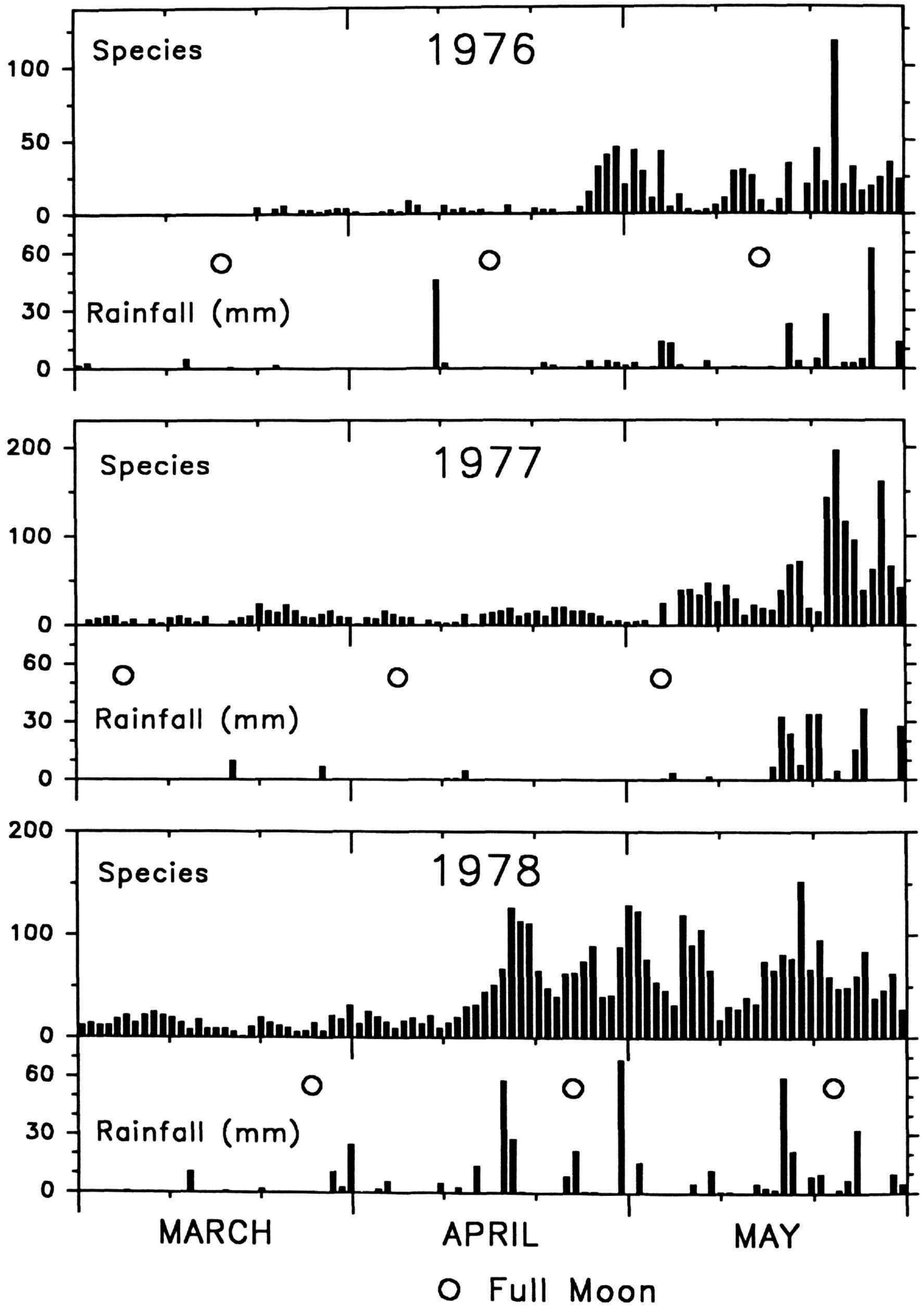

Species
1976
100
50
0
60
30
0
Rainfall (mm)
Species
1977
200
100
0
60
30
0
Rainfall (mm)
200
Species
1978
100
0
60
30
0
Rainfall (mm)
MARCH
APRIL
MAY
○ Full Moon

FIGURE 12 (left).—Number of species caught per day on BCI in period March–May in three years, together with daily rainfall over same periods (timing of full moon also indicated).

for the Mean Vector and the circular average and the angular standard deviation for the Mean Week were determined.

For BCI the results for all species of which at least 10 individuals were collected in each of the three years of the study are presented in Figure 18A. The standard deviation of the Mean Week tends to decrease with increasing values of the Mean Vector (Figure 18B, $r = -0.546$, $p < 0.001$), which means that the variation in the mean of the seasonal distribution tends to be larger when the degree of seasonality is lower. This is hardly surprising, but it is interesting to see that some species with a high Mean Vector value show a high between-year variability in Mean Week, whereas in other species the Mean Week does not change much between years in spite of a low degree of seasonality. Similar increases in the standard deviation of Mean Week with decreasing Mean Vector were found for the weevils from Las Cumbres ($r = -0.896$, $p < 0.01$), Boquete ($r = -0.929$, $p < 0.001$), and Fortuna ($r = -0.989$, $p < 0.001$). For the BCI data, the variation in Mean Vector decreased with increasing values for the average Mean Vector ($r = -0.465$, $p < 0.001$). For Las Cumbres this correlation was just significant ($p < 0.05$) but it was not at Boquete or Fortuna. The variation in Mean Week increased significantly ($p < 0.05$) at BCI as the season progressed (Figure 18C), but no such seasonal change in variability was observed

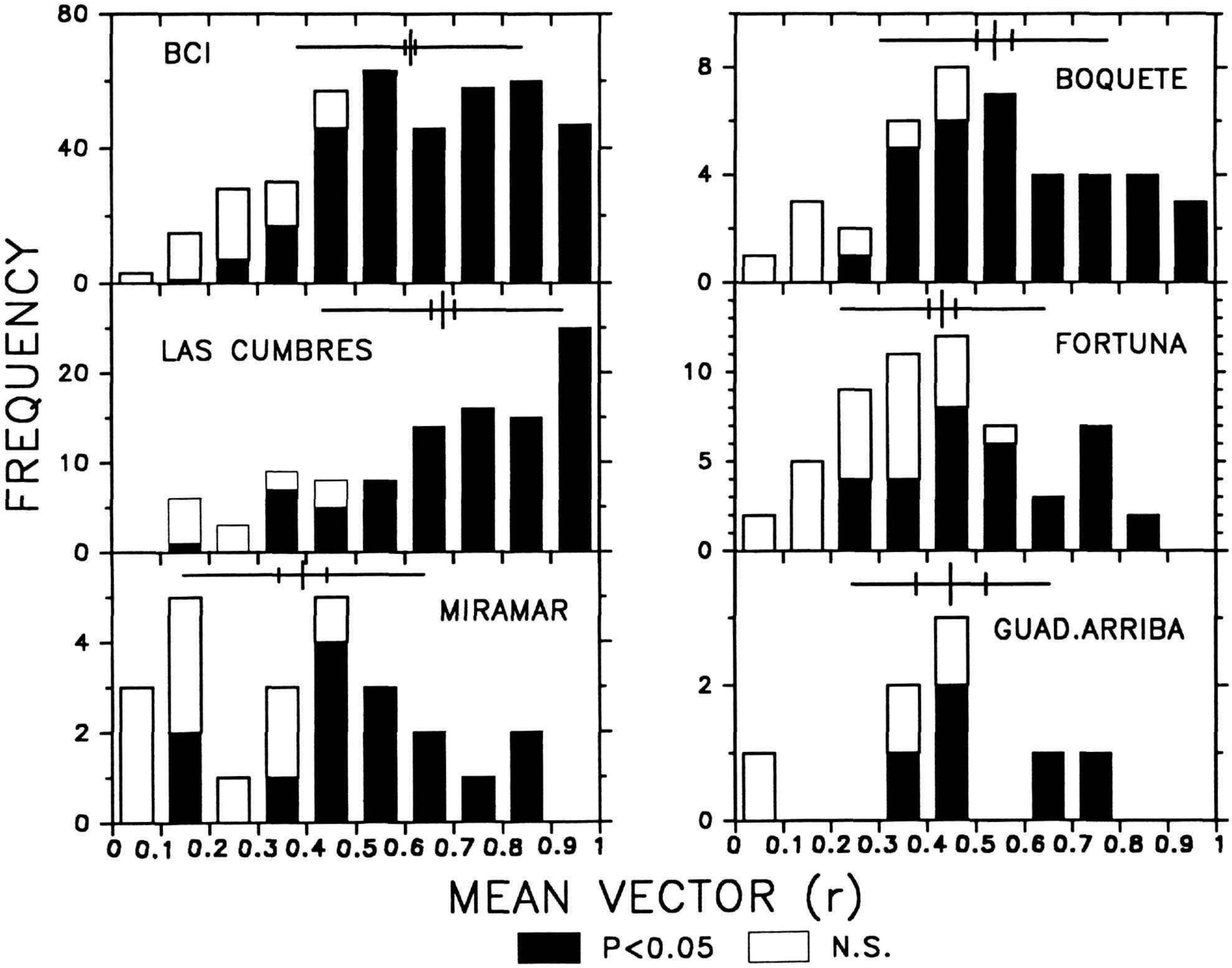


FIGURE 13.—Frequency distribution of degree of seasonality among Panamanian weevils as measured by Mean Vector (r) in six localities. Species with seasonal pattern significantly different from uniform, i.e., species that are significantly seasonal, are indicated separately from those where no significance was observed. Mean, standard deviation, and standard error of each distribution also given for significantly seasonal species.

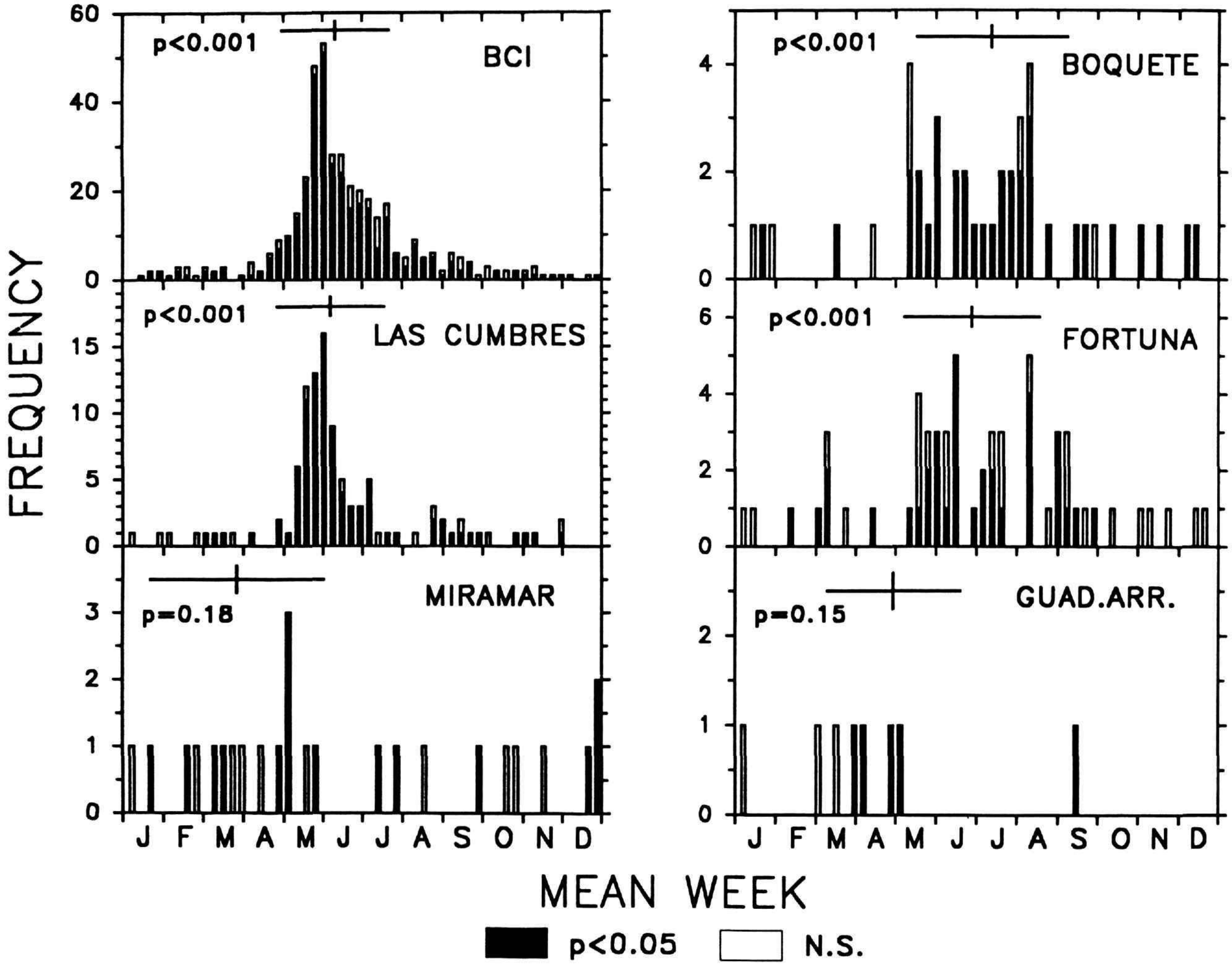


FIGURE 14.—Frequency distribution of mean week of seasonal pattern among Panamanian weevils as measured by Mean Week. Species whose seasonal pattern differ significantly from uniform, i.e., significantly seasonal species, are indicated separately from those with no significance observed. Mean, standard deviation, and standard error of each distribution also given for significantly seasonal species.

at any of the other sites. No significant seasonal change in variation in Mean Vector was observed at BCI or anywhere else.

Some examples illustrate observed between-year differences in seasonal abundance patterns. Figure 19 gives seasonal patterns for two species from BCI in two different years. For *Pseudapotrepus macrophthalmus* Champion the actual abundance patterns are similar in the two years. The much lower value for Mean Vector in 1977 is due to the relatively lower peak in May–June yielding a relatively larger effect of the low but broad peak in the fall. In 1977, 88 of the 194 individuals, 45%, occurred in the second peak, whereas in 1978, 87 out of 672, 13%, were found in the second peak. For *Conotrachelus semirufus* Champion the difference between the years was much larger. In 1978, there was a major peak in abundance in the beginning of the rainy season followed by a broad and low peak in the second half of the rainy season. The May–July peak in 1977, on the other hand, was so low that the fall peak dominated the picture. Moreover, the early peak in 1978 occurred later than the one in 1977, in spite of the fact that the rains in 1978 started earlier. In both species, there were pronounced differences between the two years, but most of those involved the relative height of the two peaks of abundance. There is no reason to call this variation anything but cyclical, i.e., seasonal, in spite of the differences.

Between-year differences in Mean Week are illustrated by

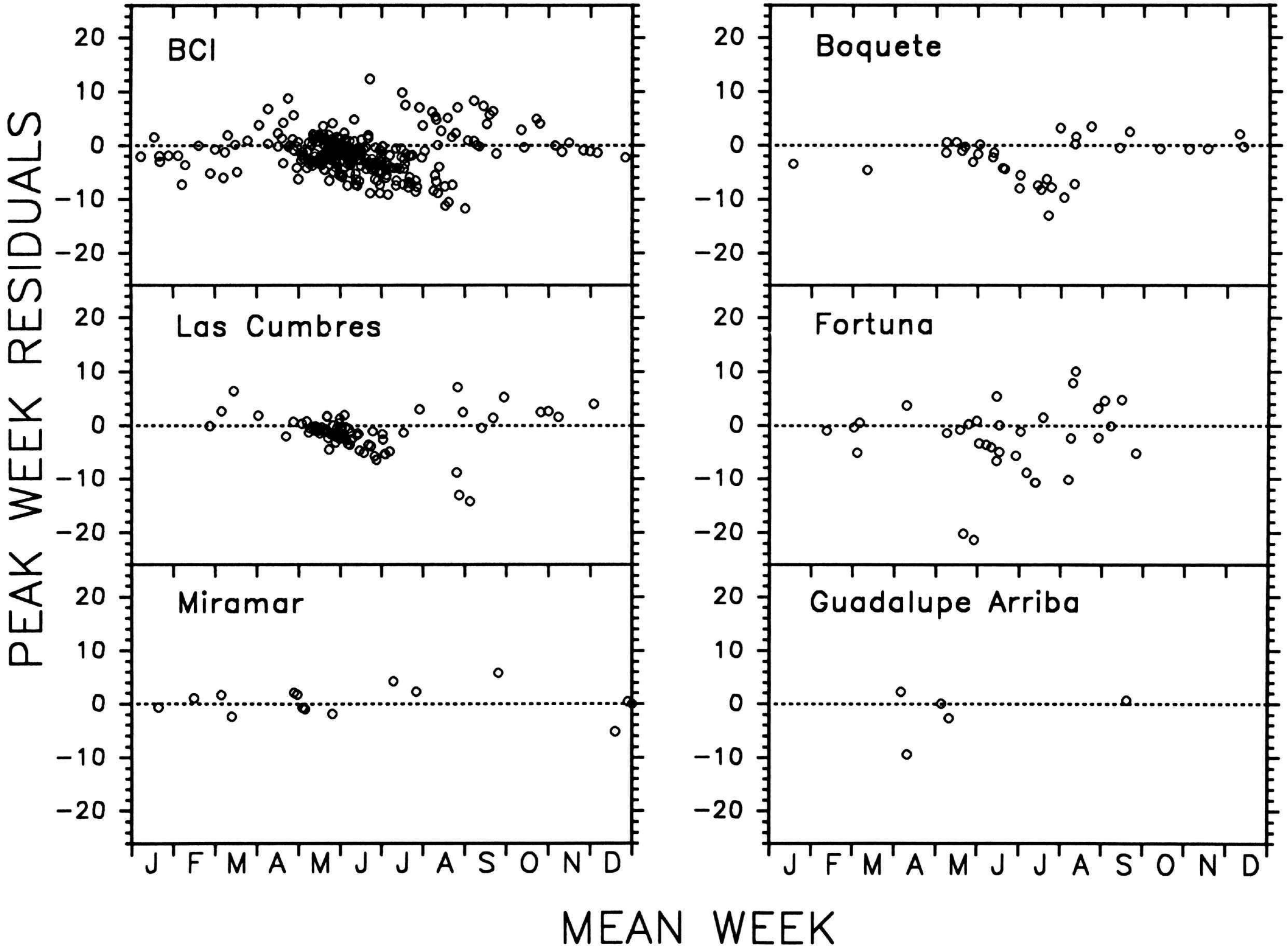


FIGURE 15.—Relation between skewness as measured by Peak Week Residuals (= Peak Week minus Mean Week), and mean as measured by Mean Week, of seasonal patterns of significantly seasonal weevil species in six Panamanian localities. Species with mode later in year than mean have positive Peak Week Residuals, those with mode earlier than mean have negative Peak Week Residuals.

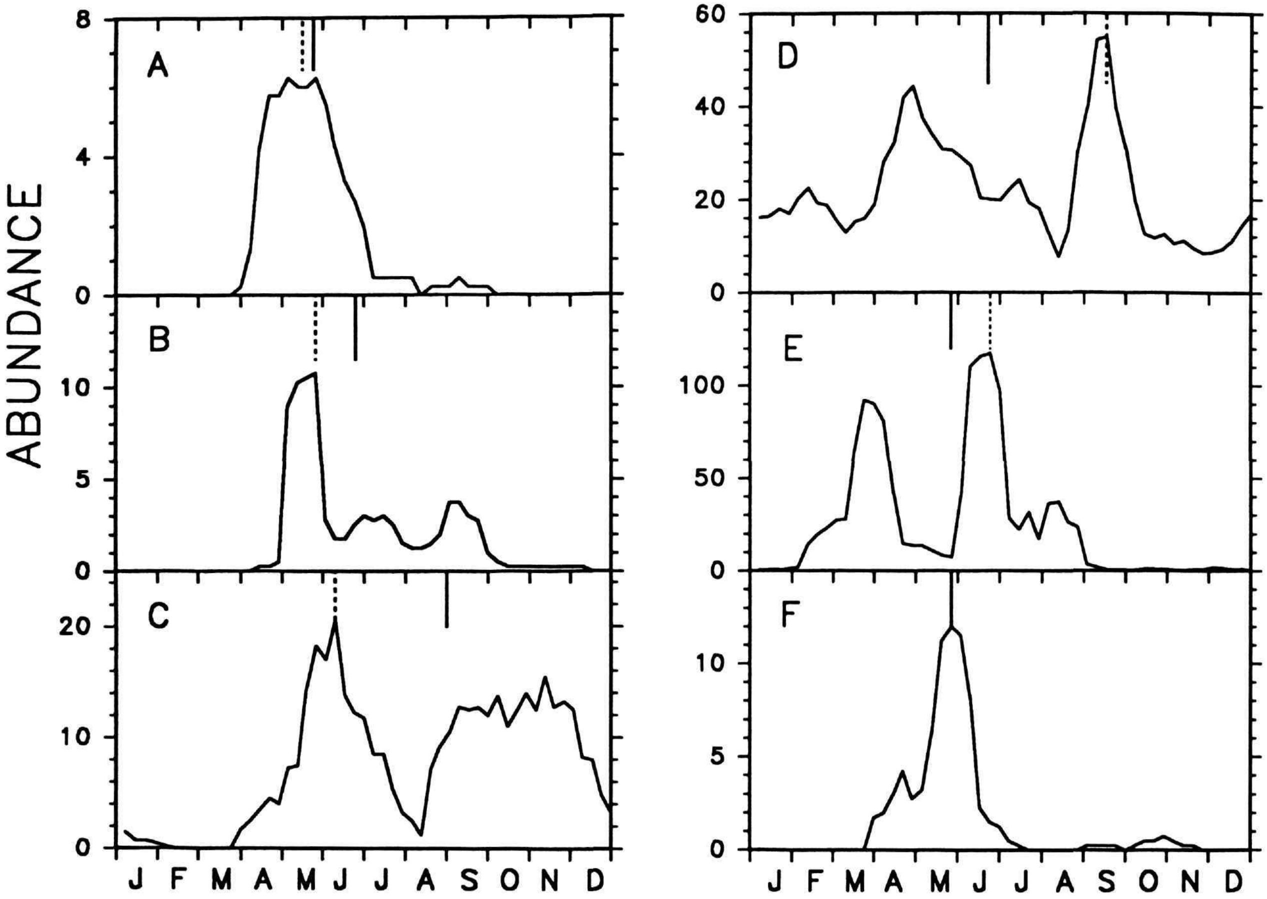


FIGURE 16.—Six examples of differences between Peak Week and Mean Week, i.e., between mean and mode of seasonal pattern (vertical lines indicate position of Mean Week (solid line) and Peak Week (dashed line); in F both lines cover each other): A, *Acamptoides* sp. #1; B, *Apion cretaceicollis* Sharp; C, Cossoninae gen. #2, sp. #1; D, *Rhinostomus barbirostris* (Fabricius); E, *Andranthobius* sp. #1; F, *Apteromechus* sp. #8.

two species from BCI, *Rhinostomus barbirostris* (Fabricius) and *Micromimus* sp. #17 (Figure 20). For *Rhinostomus* the seasonal patterns in the three years were not as different as the large discrepancies in Mean Week suggest. In 1977 the seasonal low in June–July was particularly low, so that the circular Mean Week shifted far to the right to January, between the two main peaks of September and April. In 1978, on the other hand, the low in November was particularly pronounced, shifting the Mean Week to June, between the April and September peaks. In 1976 the second low extended from November through March, putting the Mean Week in late August. It was the relative heights of the highs and lows, rather than their presence and their timing, that are different between years. A similar explanation may hold for the other species, *Micromimus* sp. #17, that had two seasonal peaks, one in May–July and the other in November–March. The difference between the two years was in the seasonal low in September–October, during which period there were several individuals in 1978 and none in 1977.

In most species, the general pattern of seasonality is similar between years, and between-year differences in measures, such as Mean Vector and Mean Week, were generated by the relative heights of the seasonal peaks rather than by a fundamental difference in seasonal pattern. In some cases, however, between-year differences are large. For instance, *Andranthobius* sp. #1 on BCI had two major peaks in each year. However, those peaks were in August and October in 1976, in May/June and August in 1977, and in April–June and September in 1978.

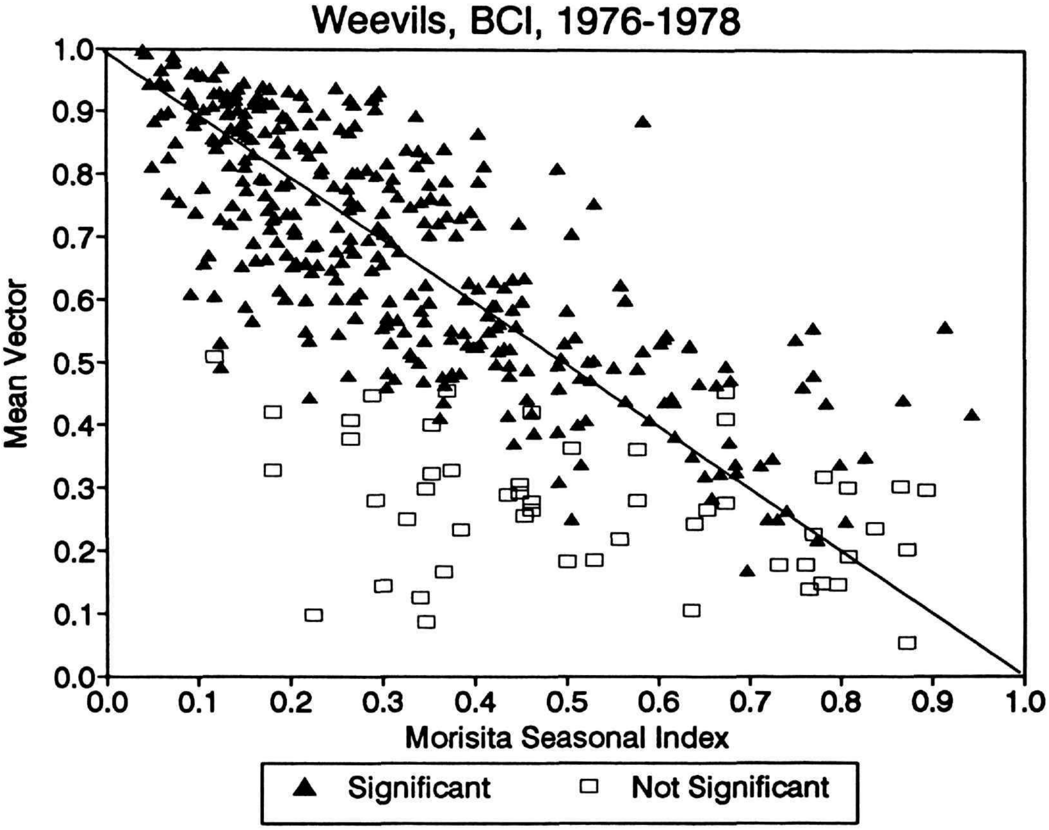


FIGURE 17.—Relationship between Mean Vector and Morisita's Index of Seasonal Diversity for weevils from BCI, all three years combined. Only species of which at least 10 individuals were collected are included. Linear correlation between all 407 data points is −0.681 ($p < 0.001$).

Similarly, *Isotrachelus* sp. #3 had its Mean Week in early November in 1976, in mid-June in 1977, and in mid-April in 1978. In 1976, however, only 11 individuals were caught and seven of these occurred in one week in November, with only two in June and two in October. The numbers are small, but the distribution was very unlike those in 1977 and 1978 when a high and sharp peak in abundance occurred early in the rainy season with low abundances toward the end of the year. It is not clear how much weight should be given to this between-year discrepancy, but it should serve as a warning that the data from one year may give an erroneous impression of data in other years, even when dealing with one species at one site. Two species from other sites, *Micralcinus* sp. #1 from Boquete and Cossoninae sp. #6 from Fortuna, emphasize this point (Figure 21). The pattern for *Micralcinus* may be explained by a bimodal distribution with the peaks occurring earlier in the second year, but the case of Cossoninae sp. #6 is different. The species occurred year-round in both years, with a pronounced peak around March 1978 and a very broad peak in October 1978 through February 1979. This very well may be a case of pronounced fluctuations without reference to the calendar seasons. A rejection of the null hypothesis of a uniform distribution does not necessarily mean that the fluctuations at hand are cyclical and thus truly seasonal.

One environmental factor affecting the seasonality of several species is the timing of the beginning of the rainy season. At BCI, Mean Weeks in 1978 tended to be a month earlier than in 1976 or 1977, which undoubtedly relates to the earlier start of the rains in 1978 (Figure 11).

WITHIN-SPECIES BETWEEN-SITE COMPARISONS.—There are clear differences in overall seasonality patterns between the sites (Figures 10, 13–15), but between-site comparisons using only species shared by these sites would be much more informative. Unfortunately, between-site variation in species composition was so large that very few species were generally

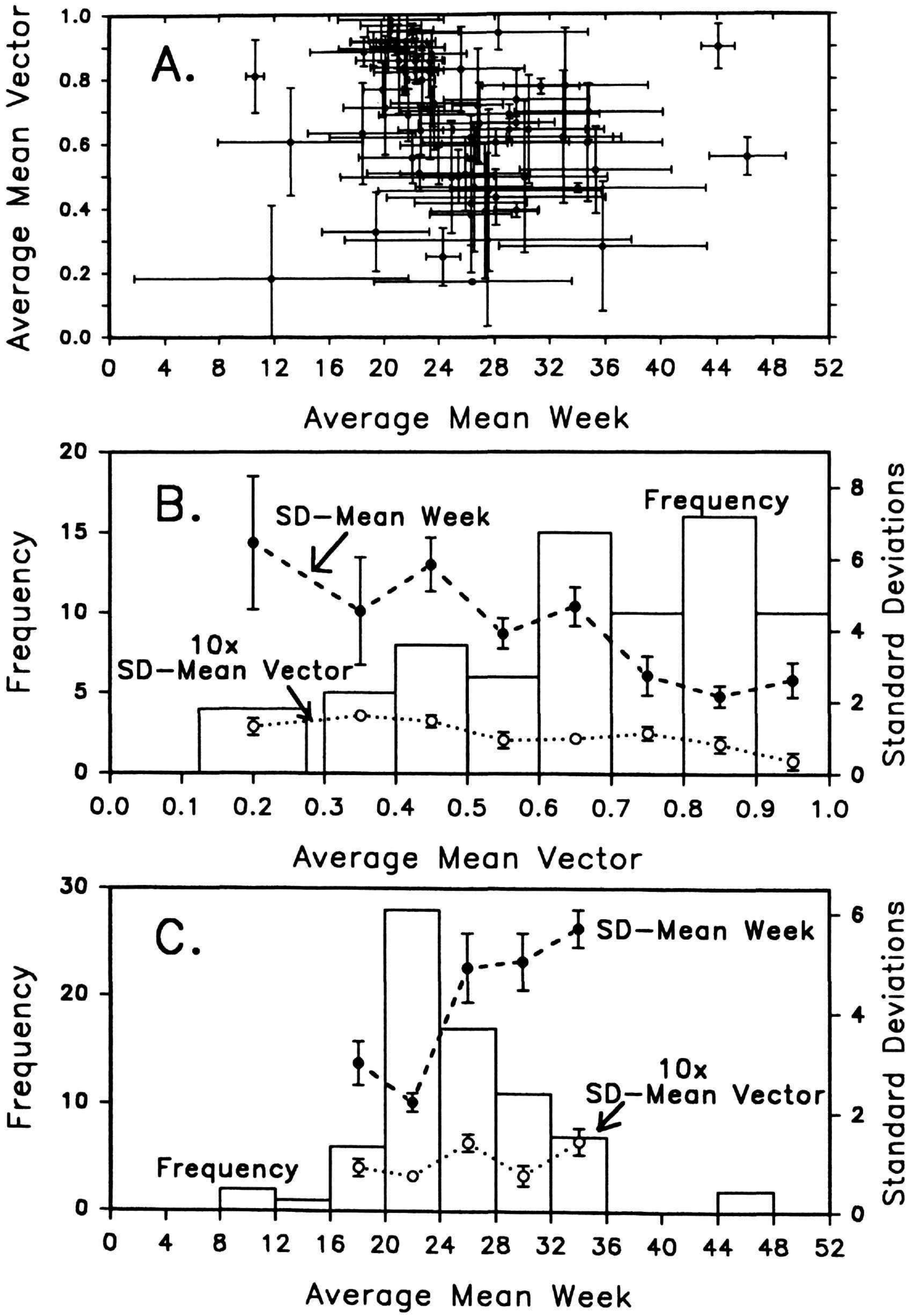

A.
Average Mean Vector
1.0
0.8
0.6
0.4
0.2
0.0
0
4
8
12
16
20
24
28
32
36
40
44
48
52
Average Mean Week
B.
SD-Mean Week
Frequency
10x
SD-Mean Vector
Frequency
20
15
10
5
0
Standard Deviations
8
6
4
2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Average Mean Vector
C.
SD-Mean Week
10x
SD-Mean Vector
Frequency
Frequency
30
20
10
0
Standard Deviations
6
4
2
0
0
4
8
12
16
20
24
28
32
36
40
44
48
52
Average Mean Week

FIGURE 18 (left).—Between-year variation in Mean Vector and Mean Week for all species collected at BCI with at least 10 individuals in each of three years: A, Average Mean Vector plotted against average Mean Week with standard deviations along both axes; B, frequency of classes of average Mean Vector and means and standard errors of standard deviations per class of Mean Week and of 10× Mean Vector; C, frequency of classes of average Mean Week and means and standard errors per class of standard deviations of Mean Week and of 10× Mean Vector.

common enough at several sites (collected with at least 10 individuals) to make possible between-site comparisons in seasonality of individual species. For each site the data from different years were pooled. Guadalupe Arriba had to be left out of these comparisons entirely because the only taxon it shared with the other sites was the *Phyllotrox* complex. For the BCI vs. Las Cumbres comparison, there were 52 species available, but the next most species-rich comparisons were those between BCI and Fortuna (12 species), BCI and Boquete (11 species), BCI and Miramar, as well as Boquete and Fortuna (10 species), and Las Cumbres and Miramar (nine species). For the other comparisons, Las Cumbres and Boquete, Las Cumbres and Fortuna, Miramar and Boquete, and Miramar and Fortuna, only five, one, two, and two species, respectively, were available.

The between-site variation in seasonal patterns is illustrated here by classifying the species in classes according to the Mean Vector values, as in Figure 18B, and by plotting the mean (angular) standard deviation of the Mean Week (Figure 22) and the standard deviation of the Mean Vector (Figure 23) against the Mean Vector classes (closed symbols, ignoring the four data points connected by a line). The within-site between-year data, which include the data from Figure 18B, also are given in Figures 22 and 23 (open symbols). For the Panamanian data, the connecting lines for each comparison, as given in Figure 18B, are omitted for reasons of clarity. For the

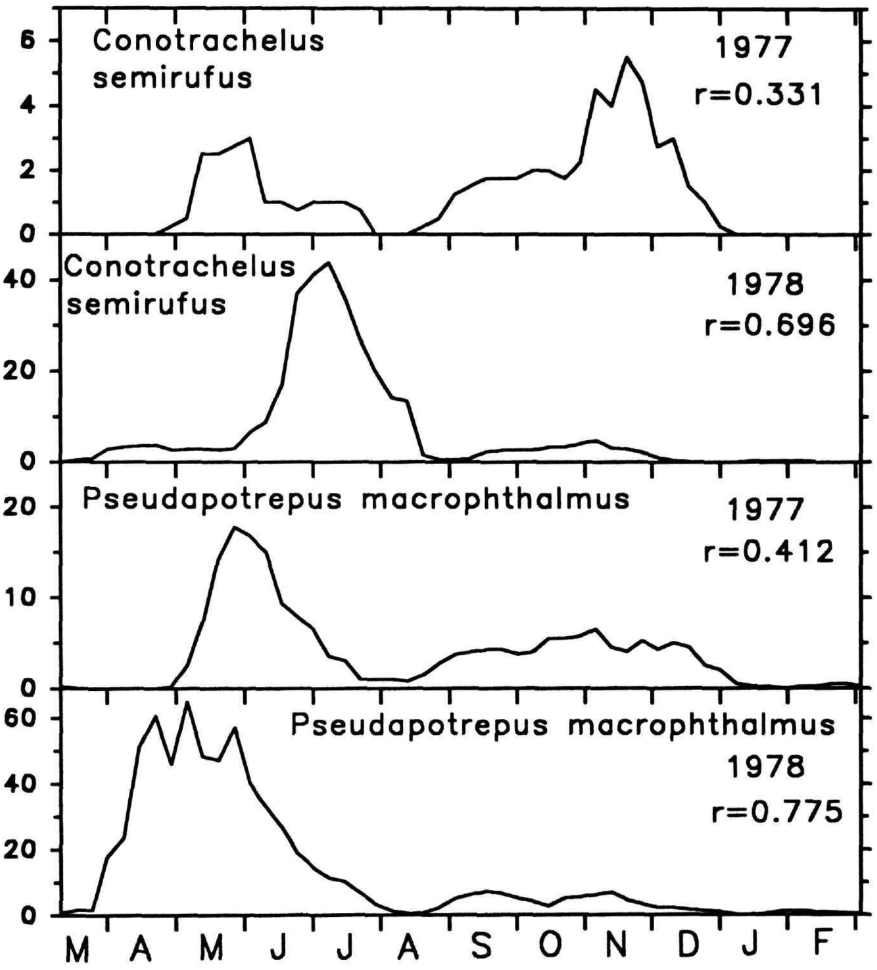


FIGURE 19.—Seasonal patterns of two species from BCI with rather extreme between-year differences in Mean Vector (graphs represent four-week moving averages of weekly totals).

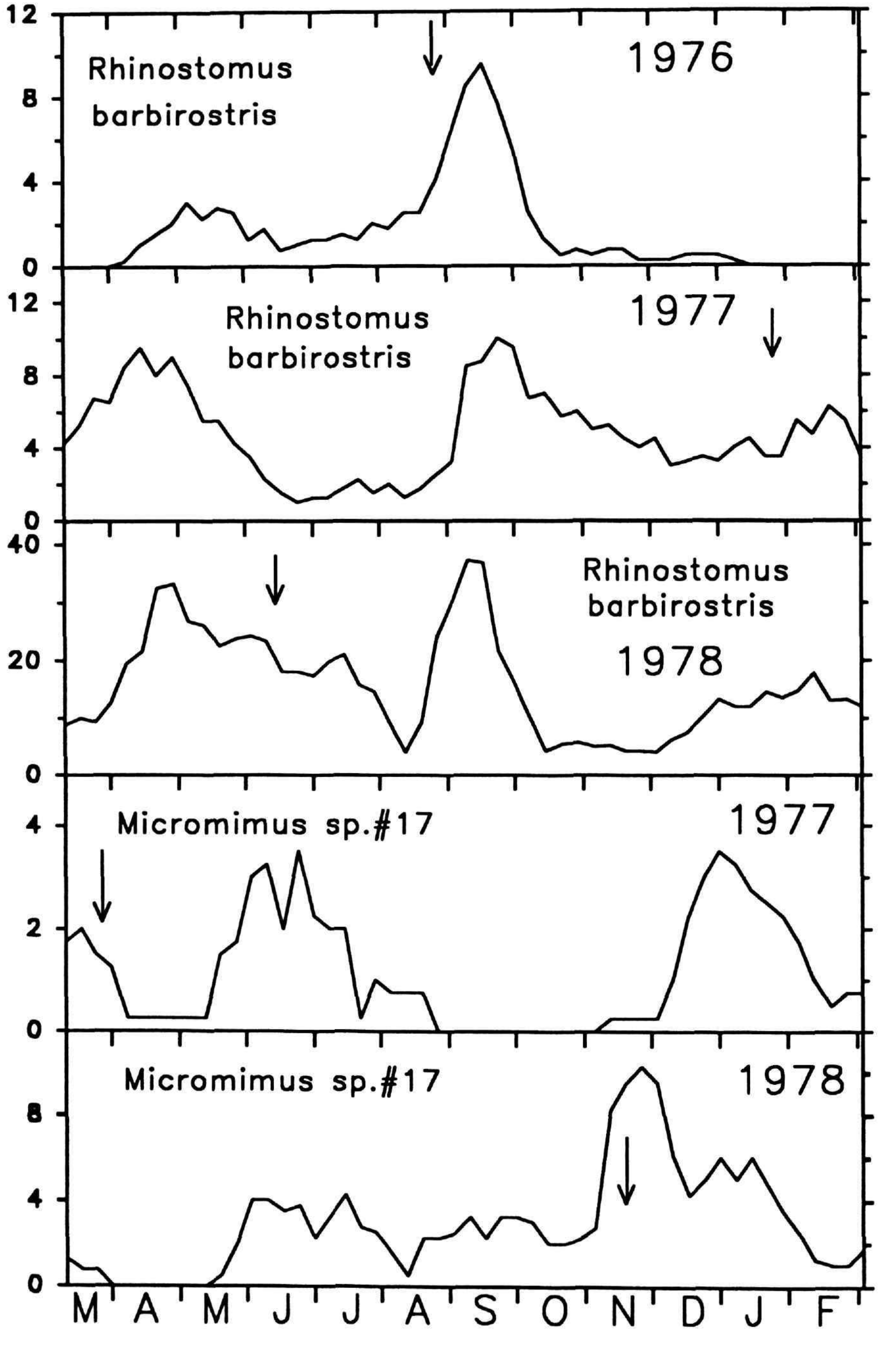


FIGURE 20.—Seasonal patterns of two species from BCI with rather extreme between-year differences in Mean Week (graphs represent four-week moving averages of weekly totals; arrows indicate position of Mean Week).

between-year data points for the Mean Week (Figure 22, open symbols), there is a clear and highly significant decrease in standard deviation ($r = -0.875$, $p < 0.001$). For the between-site data points (closed symbols), this decrease is not significant ($r = -0.360$, $p > 0.10$), and this seems to be due almost entirely to the two left-hand points. When those points are deleted, the decrease is significant ($r = -0.650$, $p < 0.01$). However this may be, it is clear that for moderate Mean Vector

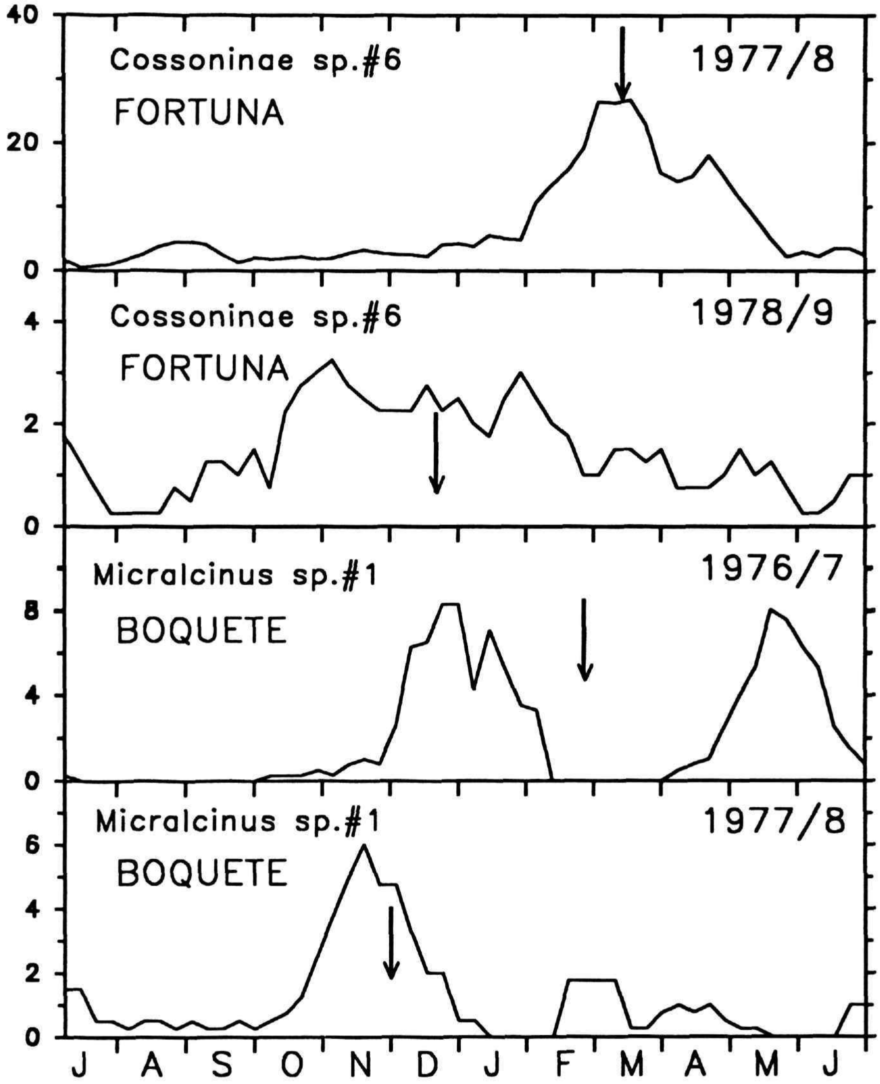


FIGURE 21.—Seasonal patterns of two species with pronounced between-year differences in Mean Week, one from Fortuna, and one from Boquete (graphs represent four-week moving averages of weekly totals; arrows indicate position of Mean Week).

values, those between 0.25 and 0.65, the between-site variation in Mean Week tends to be much larger than that between years within each site. Highly seasonal species tend to have the same variation in Mean Week between sites as within sites. For aseasonal species, one would expect an unpredictable and large variation in Mean Week between years as well as between sites, but the few data points on the left of Figure 22 do not confirm that expectation. The between-site standard deviation of the Mean Vector (Figure 23) is roughly the same as that between years. The degree of seasonality between sites varies by the same amount as that within each site between years.

For four selected species collected both at BCI and Las Cumbres, between-site variation in seasonal patterns is illustrated in Figure 24. The differences can obviously be quite large even in two climatically similar sites, such as BCI and Las Cumbres. One extreme example of such differences is given by *Micromimus minimus* (Boheman), which will be discussed below (Figure 27). Another such example is *Metriophilus minimus* Champion (data not shown). At both sites this species was found between December and August, but at BCI there was a major peak in May-June, with low abundances between December and April, whereas at Las Cumbres there was a broad peak from December through March with low abundances afterward.

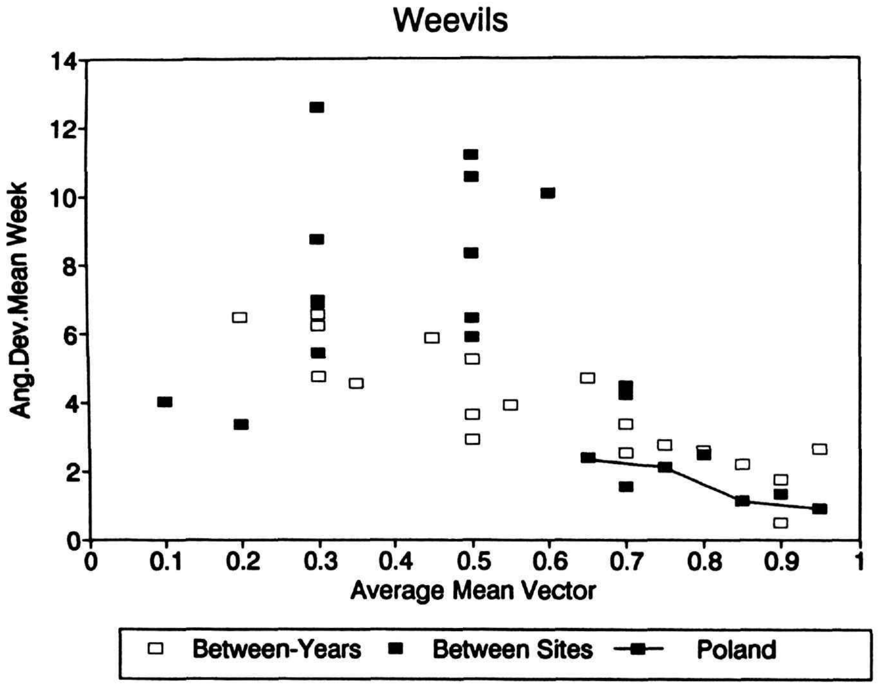


FIGURE 22.—Between-year and between-site variation in mean of seasonal distribution, as expressed by angular deviation of Mean Week, in relation to average Mean Vector (cf. Figure 18B). Between-year data for BCI, Las Cumbres, Boquete, and Fortuna; between-site data for BCI vs. Las Cumbres, Boquete, and Fortuna, Las Cumbres vs. Miramar, and Boquete vs. Fortuna. (Four between-site points connected by line represent data from Lublin Plateau in Poland (Cmoluch, 1962).)

At climatically very different sites the differences can be even larger. This is illustrated for six species in the BCI vs. Miramar comparison, the seasonal patterns of which are given in Figure 25. Especially in Cossoninae gen. #2, sp. #1, but also in *Conotrachelus turbatus* Faust and *Heilus bioculatus* (Boheman), the differences are spectacular. Similarly, *Conotrachelus cristatus* Fahraeus at Las Cumbres (data not shown) occurred throughout the rainy season, with a maximum in October-November, and was absent during the dry season (January-April), but at Miramar had a sharp peak in April. Fortuna also has an aseasonal climate, but the differences between Fortuna and BCI in the seasonal patterns of all 12 shared useable species (Figure 26) are not very spectacular in most instances. For many species the seasonal pattern was rather similar (Figure 26A,D,H,J,L), in others there was a second peak at Fortuna that was absent or nearly absent at BCI (Figure 26B,G,K), whereas in only a few species there was a suggestion of the pattern being less seasonal at Fortuna (Figure 26C,E). The similarity in many species between Fortuna and more seasonal sites may be related to the proximity of Fortuna to the seasonal Pacific side of Panama. For example, Boquete and Fortuna, which are only 20 kilometers apart, have very different weather patterns, yet eight of their ten usable species have similar seasonal patterns. *Conotrachelus fulvescens* Champion was bimodal in Boquete, with pronounced peaks in May and in November-December, but had just one sharp peak in February in Fortuna. On the other hand, *Conotrachelus crenatus* Champion had one sharp peak in April-May in Boquete and was bimodal in Fortuna, with peaks in April-May and in January-February.

Unfortunately, species that occurred in reasonable numbers at more than two sites were very rare. Apart from the *Phyllotrox* complex, none of the species had at least 10 individuals in all six sites or even at five sites. Only three species were "common" at four sites. The seasonal patterns of these three species are shown in Figure 27. *Hemiliopsis nudicollis* (Chevrolat) occurred year-round in at least three, possibly all, of the four sites. On BCI it had a major peak in April-June, at the beginning of the rainy season, with the abundance tapering off toward the end of the year. In January-February, the early dry season, there was a secondary peak in seasonal abundance. In Fortuna, in spite of its much less seasonal climate, the pattern was almost identical to that on BCI, except for the absence of the January-February peak. In Miramar the numbers were too low to make definite statements about the seasonal patterns, but the absence of any individuals in May-July is curious. In Las Cumbres there was a broad peak in abundance from November to March, with lower abundances the rest of the year. Only at

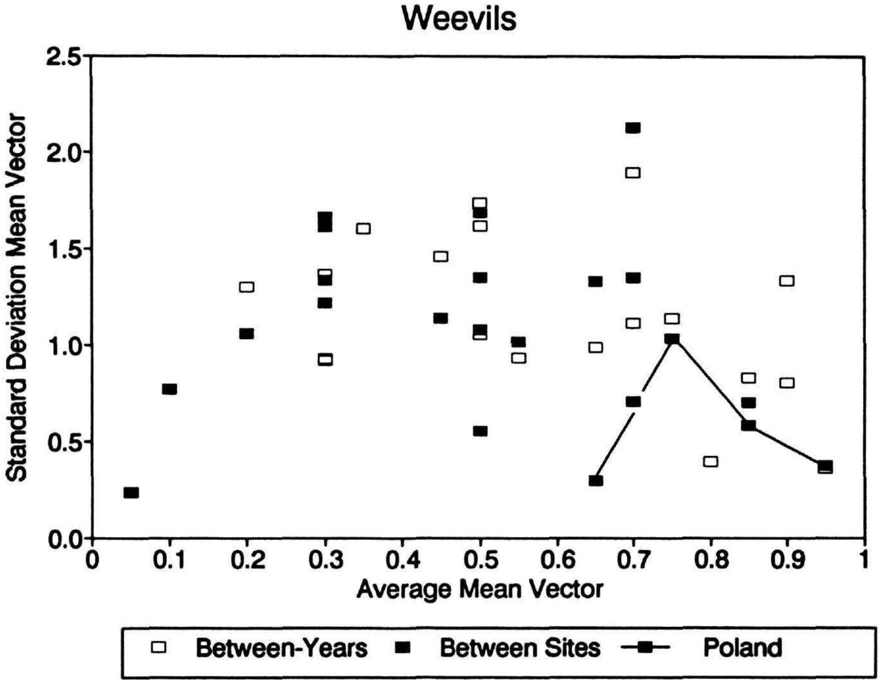


FIGURE 23.—Between-year and between-site variation in degree of seasonality, as expressed by standard deviation of Mean Vector, in relation to average Mean Vector (cf. Figure 18B; for further details see Figure 22).

BCI and Fortuna was the seasonal distribution of abundance significantly different from uniform. *Pseudapotrepus macrophthalmus* Champion had a major peak in April–June in BCI, Boquete, and Fortuna, which is the early rainy season at the first two sites but not in Fortuna, with a low abundance during the rest of the rainy season and a near-absence during the dry season. The pattern in Miramar was clearly different in that the species occurred year-round with peaks that seem unlikely to be seasonal. Miramar was a relative aseasonal site, but so was Fortuna. The seasonal variation in abundance was significantly different from uniform in all sites but Miramar. *Micromimus minimus* (Boheman) was even more curious. The fairly sharp seasonal peak on BCI occurred in April–June, but in Las Cumbres, as well as Boquete, the peak occurred in November through January, whereas the pattern at Miramar was a hybrid between these two patterns (see below for the taxonomy of this species in Boquete). Again, the pattern at Miramar was the only one not different from uniform.

These between-site differences in seasonal patterns of individual species do not seem to be clearly related to differences in climate. Miramar did have the least seasonal abundance patterns in both *Micromimus* and *Pseudapotrepus,* but Fortuna did not show any hint of an effect of its relatively aseasonal climate. This brings us to a difficult problem. How sure are we that we are indeed dealing with the same species at all these sites? After careful re-examination of the specimens of *Micromimus minimus,* it was found that the specimens from Boquete had slightly different male genitalia; thus they probably represent a new species, referred to here as "nr. *minimus*." However, no such differences were found between the specimens from BCI, Las Cumbres, and Miramar. So the large difference in seasonal pattern between BCI and Las Cumbres remains, and we may have to accept that the almost identical patterns of Las Cumbres and Boquete were produced by different species. No other between-site morphological differences have been found thus far in any of the other species, so that to the best of our knowledge we are dealing with the same species in each case. We will assume that our identifications were correct, although we realize that the taxonomy of these tropical weevils is still in its infancy. Many of the species we collected remain to be described, and most of what we know is based on morphology, with virtually nothing known about weevil behavior or genetics. Sibling species, well known in many groups in temperate areas and thus likely to occur in the tropics as well, are unknown at this moment among Panamanian weevils. We must proceed under the assumption that the specimens, which on morphological grounds are considered to belong to the same species, are indeed conspecific.

DISCUSSION OF SEASONALITY

In discussions of seasonal abundance patterns, the data are usually presented in graphical form, which works well for a

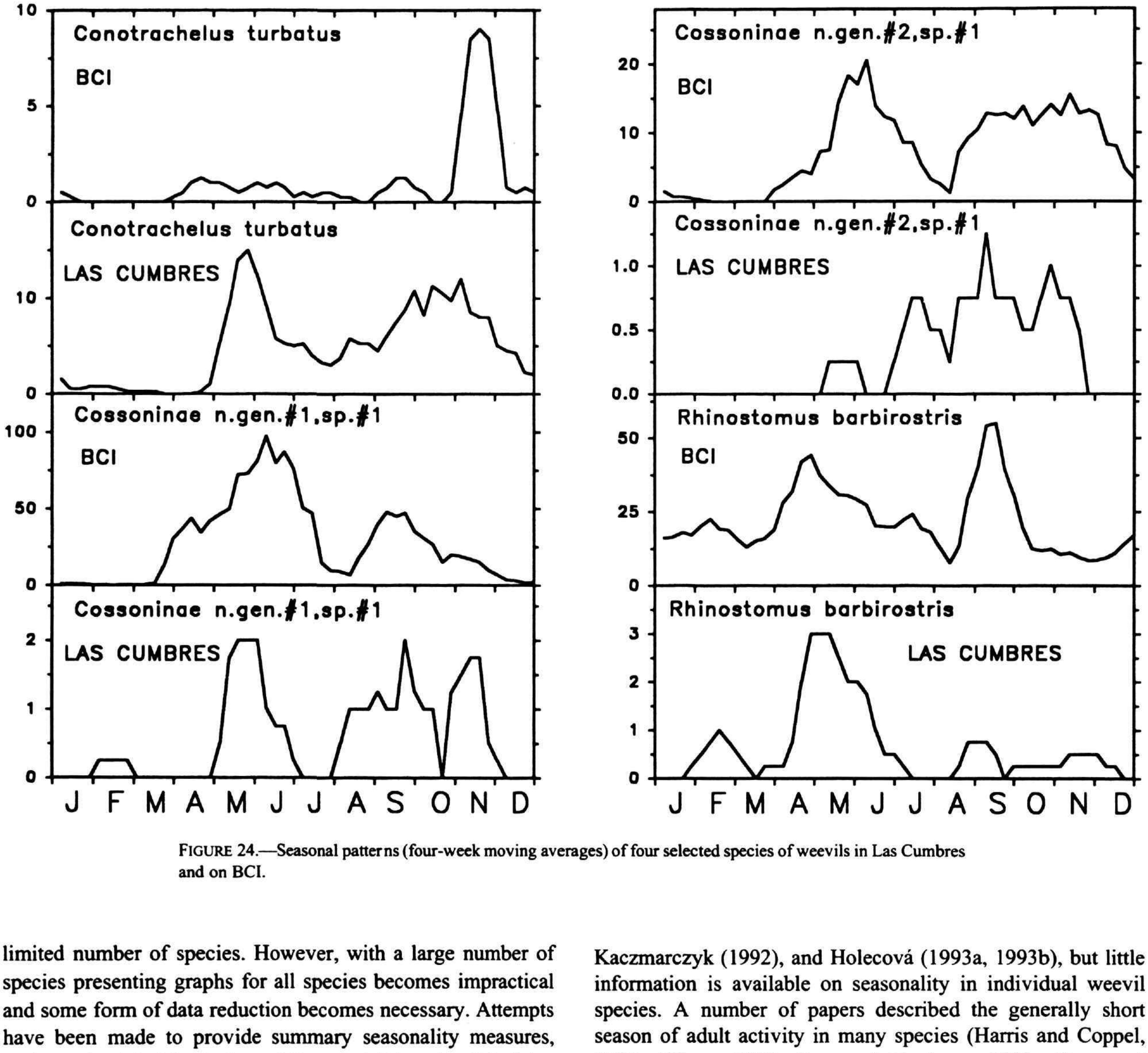
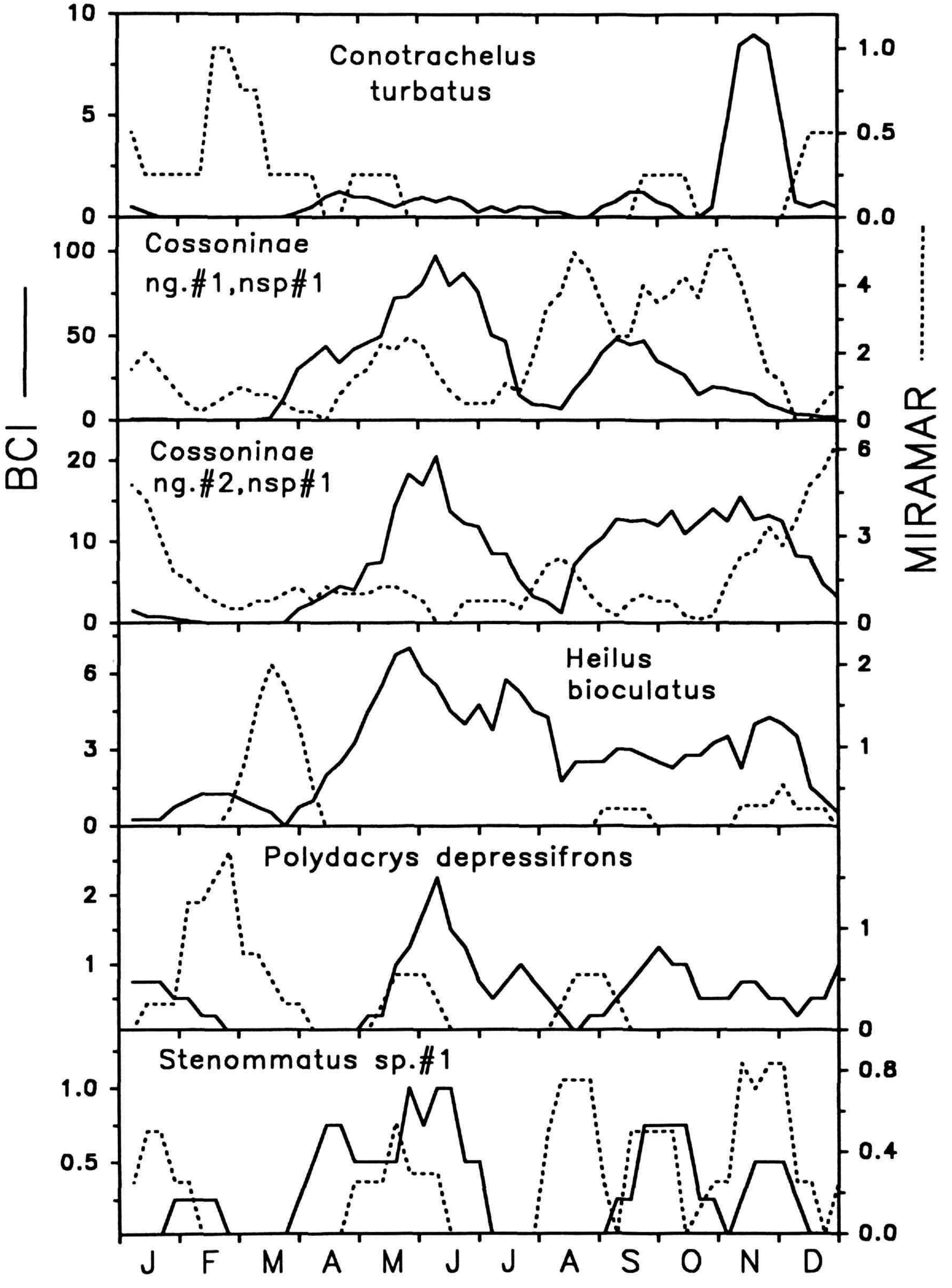


FIGURE 24.—Seasonal patterns (four-week moving averages) of four selected species of weevils in Las Cumbres and on BCI.

limited number of species. However, with a large number of species presenting graphs for all species becomes impractical and some form of data reduction becomes necessary. Attempts have been made to provide summary seasonality measures, such as the Morisita Index of Seasonal Diversity (Morisita, 1967; Yamamoto, 1974) and Seasonal Range and Seasonal Maximum (Wolda, 1979). However, we found those measures unsatisfactory. As the above chapters show, circular statistics do provide useful descriptors of seasonal patterns, especially when dealing with large numbers of species. The measures, Mean Vector, an indicator of the degree of seasonality, Mean Week, the mean of the seasonal distribution, and the difference between mode (Peak Week) and mean (Mean Week) of the seasonal distribution, turned out to be very useful.

Information on seasonal patterns of temperate weevils as a group were given by Petryszak (1981, 1987, 1988, 1991), Kuśka (1982), Knutelski (1988, 1991), Petryszak and Kaczmarczyk (1992), and Holecová (1993a, 1993b), but little information is available on seasonality in individual weevil species. A number of papers described the generally short season of adult activity in many species (Harris and Coppel, 1967; Silver, 1968; Fye and Bonham, 1970; Overgaard Nielsen, 1974b, 1974c; Hansen, 1987; Stachowiak, 1991; Holecová, 1991a, 1991b, 1991c, 1992, 1993c, 1993d; Stachowiak, 1991; Knutelski, 1993). Although the season of some species may extend over most of the summer (Attah and Lawton, 1984; Isono et al., 1986; Holecová, 1991a, 1991b, 1991c, 1992, 1993c, 1993d), no species seem to be active most of the year. The active season is often interrupted by hibernation in winter (Davey, 1956; DeSteven, 1981; Menu,

FIGURE 25 (right).—Seasonal patterns (four-week moving averages) of six species of weevils from BCI and Miramar.


Conotrachelus turbatus
Cossoninae ng.#1,nsp#1
Cossoninae ng.#2,nsp#1
Heilus bioculatus
Polydacrys depressifrons
Stenommatus sp.#1
BCI
MIRAMAR
10
5
0
1.0
0.5
0.0
100
50
4
2
20
6
3
2
1
0.8
0.4
J F M A M J J A S O N D

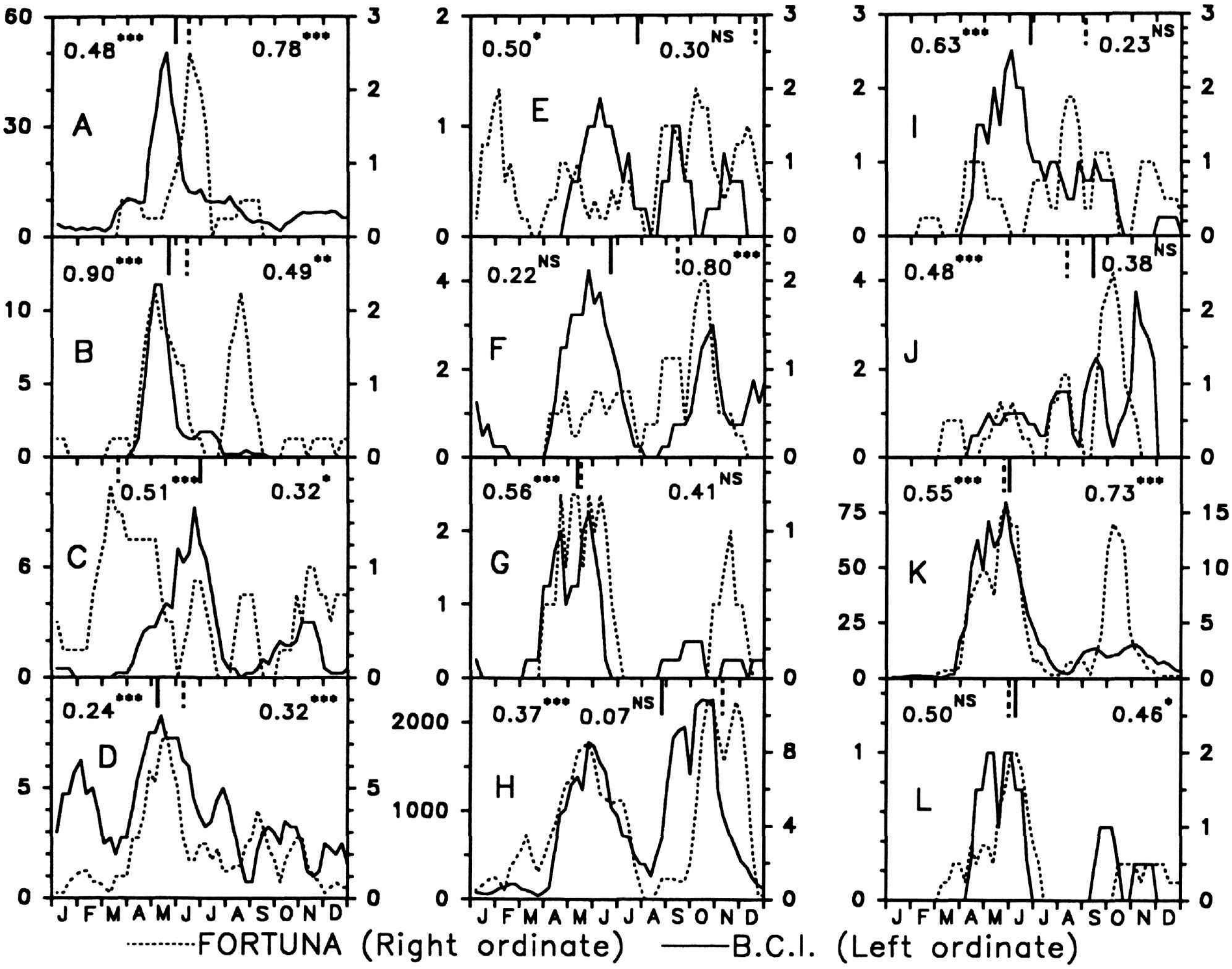


FIGURE 26.—Seasonality patterns (four-week moving averages) of 12 species of weevils with at least 10 individuals both at Barro Colorado Island and at Fortuna (data from different years are pooled; Mean Vector values and their significance indicated on left for BCI and on right for Fortuna): A, *Apion* "complex"; B, *Conotrachelus* sp. #77; C: *Conotrachelus brevisetis* Champion; D, *Hemiliopsis nudicollis* (Chevrolat); E, *Micromimus* sp. #2; F, *Micromimus* sp. #3; G, *Paratrachelizus* sp. #2; H, *Phyllotrox* "complex"; I, *Pisaeus varicus* Champion; J, *Pseudanchonus occultus* (Champion); K, *Pseudapotrepus macrophthalmus* Champion; L, *Stereodermus calvus* Sharp (Mean Week indicated by vertical lines).

1993; Menu and Debouzie, 1993). In very few cases does the published information on temperate weevils allow calculation of seasonality measures, such as the Mean Vector. Exceptions are studies in Poland by Cmoluch (1962) at the Lublin Plateau and by Cmoluch et al. (1975) at the Sandomierz area. In these studies, the percentages of species with a Mean Vector larger than 0.80 were 90.6% and 62.7%, respectively, whereas for Panamanian weevils these percentages ranged from 3.5% at Fortuna and 8.0% at Miramar to 26.3% at BCI and 38.5% at Las Cumbres (Figure 13). Mean Vector values smaller than 0.60 occurred in only one percent of the species at the Lublin Plateau and two percent at Sandomierz. For all Panamanian sites, these percentages were much higher (Figure 13), ranging from 32.7% at Las Cumbres and 48.2% at BCI to 79.3% at Fortuna and 80.0% at Miramar. The Mean Week for all species at the two Polish sites occurred between May and September, whereas at all Panamanian sites the Mean Week was found to occur at any time of the year (Figure 14). Some of this may have been due to the fact that no samples were taken at the Polish sites from October to April, but we have been told that very few, if any, weevils are active in eastern Poland at that time of the year. This summary illustrates, for the first time in

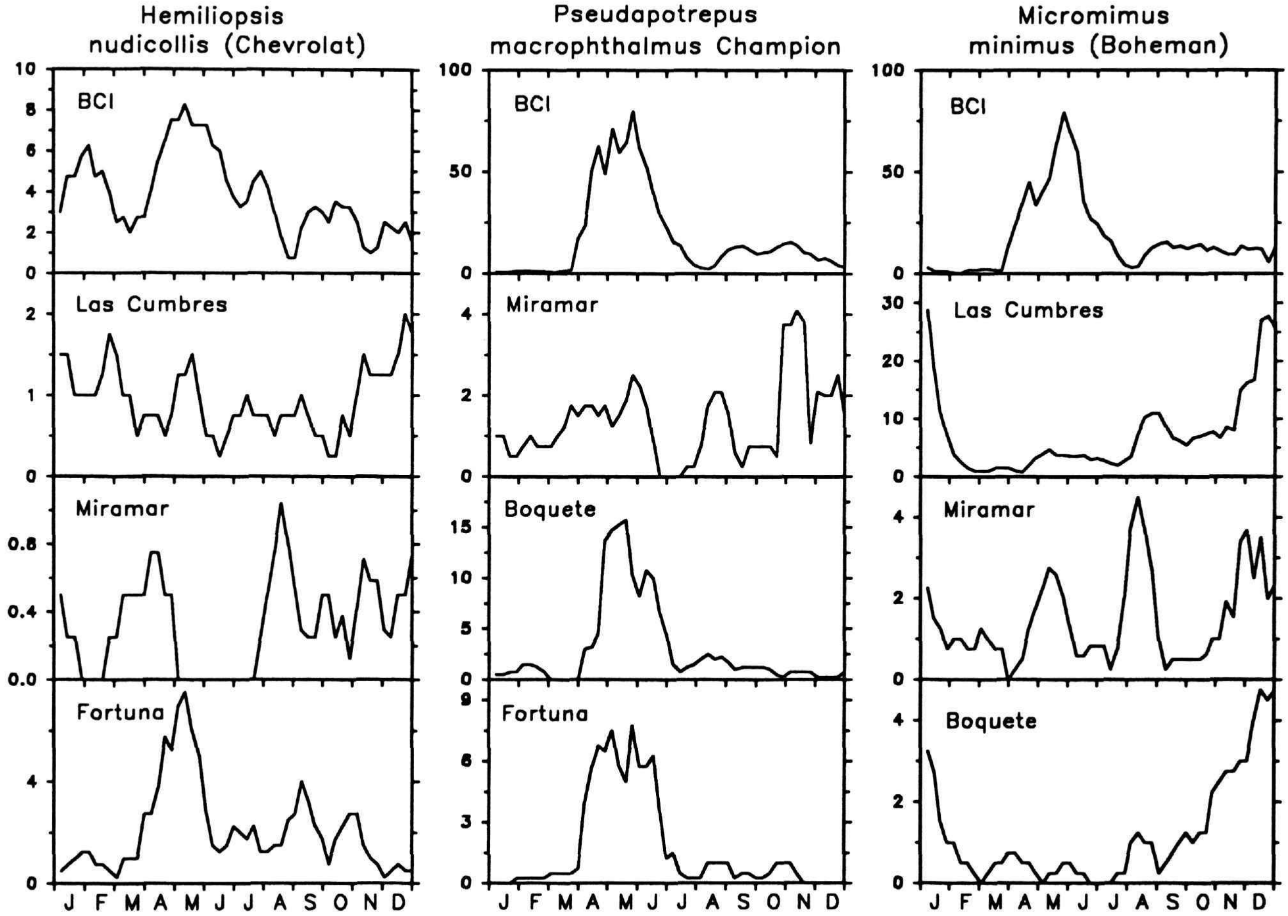


FIGURE 27.—Seasonal patterns (four-week moving averages) of three species with at least 10 individuals at four sites.

quantitative terms, the differences in seasonality patterns between weevils from a tropical area and two sites in the temperate zone. In broad lines, these data may in fact represent differences between the temperate zone and the tropics in general, although details will have to be filled out when more data become available.

Little is known about between-year variation in seasonality in most temperate weevils. Some reported no differences between years (Fye and Bonham, 1970; Hansen, 1987), whereas others discussed a between-year variation that extended at most a few weeks (Overgaard Nielsen, 1974c; Vittum and Tashiro, 1987; Phillips, 1992; Knutelski, 1993). We know of no published information on between-year variation in seasonality of temperate weevils that can be used for an analysis similar to the one given in Figure 18. For between-site variation in seasonality, the only useable information we found was on weevils at the Lublin Plateau in Poland (Cmoluch, 1962). Those data are from six sites, and of 25 weevils species collected, at least 10 individuals were taken from at at least two of those sites. The between-site variation in Mean Week is indicated for these data in Figure 22. Similarly, the between-site variation in Mean Vector in Poland is not much different from that in Panama (Figure 23). If anything, the between-site variation in both Mean Vector and Mean Week in Panama is somewhat larger than that in Poland, but if such differences in variability exist, they are not very pronounced, at least not in the present data.

Almost no published information is available on seasonality of tropical weevil species and its between-year and between-site variability. It is known that weevils as a group occurred year-round, walking up and down tree trunks, in a seasonally flooded forest near Manaos, Brazil, but no information on individual species was available (Adis, 1979, 1981). León (1980) reported that the boll weevil in Nicaragua is active for a longer period than at temperate latitudes, e.g., North Carolina (Fye and Bonham, 1970).

The Panamanian weevils as a group (Figures 6, 10) had a strong tendency toward bimodality, at least at the more seasonal sites, with one peak occurring near the beginning of the rainy season in May/June and one later in that season, around October. A similar bimodality was found in many groups of temperate weevils (Kuśka, 1982; Petryszak, 1987, 1988; Knutelski, 1988, 1991, 1993; Petryszak and Kaczmarczyk, 1992; Holecová, 1992), with some exceptions (Holecová, 1991a, 1993a, 1993b, 1993c). A major difference, however, between temperate and tropical weevils is that in the tropics at least some weevils are active at any time throughout the year. Among tropical weevils there are pronounced peaks in abundance, but the annual lows for total weevil abundance are rarely zero.

At the level of individual Panamanian species a very large variation in seasonal patterns was observed. Some species occurred throughout the year, sometimes without any clear seasonal variation, whereas at the other extreme some species had very short activity periods, with a sharp seasonal peak (Figure 13), just as do many temperate species. Many species, however, were bimodal in distribution, similar to many temperate species (Stachowiak, 1991; Knutelski, 1993). The difference, again, is that species that are active the year round, with or without clear seasonal peaks, have not been observed in the temperate zone, at least in areas with a cold winter. For those few temperate data sets where we have been able to calculate the same seasonality measures used for the Panamanian weevils, we found an absence of low values of the Mean Vector, no species with nonsignificant values of Mean Vector, and a preponderance of high Mean Vector values. Not surprisingly, the temperate data showed a much higher degree of seasonality than the tropical ones, but that differences is quantified here for the first time. The means of the seasonal distribution (Mean Week) for temperate weevils are concentrated in the summer months only, with none occurring from fall through spring. However, in a warm temperate area, such as the Orange Free State in South Africa (Louw, 1987), the seasonal distributions of weevil species seems remarkably similar to the one observed for weevils in Panama. There too, some species were found active at any time of the year, although often with clearcut seasonal peaks. For other groups of insects in Panama, a similar large variation in seasonal patterns has been observed (Wolda, 1980; Wolda and Fisk, 1981; McElravy et at., 1982; Wolda and Broadhead, 1985; Wolda and Flowers, 1985; Cwikla and Wolda, 1986; Wolda and Ramos, 1992; Wolda, unpublished data).

For most Panamanian species, seasonal patterns are rather similar in successive years, in degree of seasonality (Mean Vector), and in the mean of the seasonal distribution (Mean Week) (Figure 18), although there may be a shift with a later or earlier onset of the rainy season (Figures 11, 12). However, there are strong exceptions to this general rule (Figures 19–21). In a number of these instances, the between-year differences observed were so large that additional years of data would be needed to determine whether we were dealing with a variable but seasonal pattern or with a variation in abundance that was unrelated to seasons. In other cases, it was clear that any relationship between abundance and climatic seasons was tenuous, if it existed at all. This is very different from the situation among temperate weevils based on the small amount of information we have been able to glean from the literature. Between-year differences in seasonal patterns among these temperate weevils seems to be restricted to shifts of a few weeks at best, often related to spring temperatures (Silver, 1968; Fye and Bonham, 1970; Overgaard Nielsen, 1974c; Holecová, 1991a). Large between-year differences in seasonal patterns in tropical insects are not restricted to weevils but also have been found in nocturnal bees (Wolda and Roubik, 1986), and Homoptera and Blattaria (Wolda, 1989; unpublished data). Trichoptera from Puerto Rico showed large between-year differences in emergence patterns (Masteller and Flint, 1992).

At intermediate degrees of seasonality, between-site variation in Mean Week tends to be considerably larger than variation between years at each site (Figure 22), but for more seasonal species, the ones with higher values for Mean Vector, no such difference was found. The variation in the degree of seasonality was essentially the same between sites as between-years (Figure 23). Seasonal patterns of several weevil species were generally rather similar in different Panamanian sites, in spite of differences in altitude or climate, but in a number of species the between-site differences were striking (Figures 24–27), even when the climatic conditions at the sites were similar, such as on Barro Colorado Island and in Las Cumbres. The three species illustrated in Figure 27 clearly demonstrate such large between-site differences in seasonality. In some cases, the different patterns were clearly related to differences in climate. *Pseudapotrepus macrophthalmus* Champion (Figure 27) was much less seasonal in Miramar, a site that is climatically also relatively nonseasonal. On the other hand, in Fortuna many clearly seasonal patterns were observed, although it also is rather nonseasonal in rainfall (Figure 26). Among other Panamanian insects, similar between-site differences were observed (Wolda, 1982, unpublished data; Rutledge et al., 1976). Examples of such between-site differences in seasonality in temperate weevils are rare in the literature (Fye and Bonham, 1970), although they probably are common along large latitudinal gradients. For smaller areas, however, the between-site differences seem to be small. Unfortunately, most published data only allow qualitative comparisons as they do not permit calculations of measures, such as Mean Vector or Mean Week. Stachowiak (1991) observed very similar seasonal patterns in two different Polish sites. Knutelski (1993) found that the activity seasons at higher altitudes (± 1500 m) tended to occur a little later than those at lower levels (± 900 m) in the Tatra Mountains in southern Poland, but even there the differences seemed to be small relative to many of those found among the Panamanian weevils. The only data set known to us that can be used for quantitative between-site comparisons (Cmoluch, 1962) suggests that, if anything, Panamanian weevils show higher between-site variability in both Mean Week (Figure 22) and Mean Vector (Figure 23) than do weevils from eastern Poland. However, the result is far from convincing, and more data from different areas both in the temperate zone and in the tropics are needed to answer questions about tropical-temperate differences in seasonality patterns.

The richness in seasonality patterns among tropical insect species is spectacular, as are the sometimes large between-year and between-site differences in those patterns, as illustrated here for Panamanian weevils. This is a first large-scale descriptive study of those patterns, and analyses and explanations about the causes of these patterns and the between-species, between-year, and between-site differences therein will have to await future studies.

Appendix

List of Species of Weevils Collected by Light Traps in Seven Localities in Panama

(BCI = Barro Colorado Island, LCC = Las Cumbres, MIR = Miramar, CGR = Corriente Grande, BOQ = Boquete, FOR = Fortuna, GUA = Guadalupe Arriba.)

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
ANTHRIBIDAE							
1980a Anthribidae	18	-	-	-	-	-	-
2071 Anthribidae	11	-	-	-	-	-	-
2688 Anthribidae	1	-	-	-	-	-	-
2881 Anthribidae	1	-	-	-	-	-	-
2883 Anthribidae	11	-	-	-	-	-	-
2896 Anthribidae	1	-	-	-	-	-	-
2941 Anthribidae	5	-	-	-	-	-	-
2943 Anthribidae	1	-	-	-	-	-	-
2956 Anthribidae	1	-	-	-	-	-	-
2961 Anthribidae	5	-	-	-	-	-	-
2962 Anthribidae	4	-	-	-	-	-	-
2972 Anthribidae	3	-	-	-	-	-	-
2987 Anthribidae	1	-	-	-	-	-	-
2994 Anthribidae	4	-	-	-	-	-	-
3021 Anthribidae	4	-	-	-	-	-	-
3022 Anthribidae	1	-	-	-	-	-	-
3044 Anthribidae	7	-	-	-	-	-	-
3047 Anthribidae	1	-	-	-	-	-	-
3048 Anthribidae	2	-	-	-	-	-	-
3109 Anthribidae	1	-	-	-	-	-	-
3112 Anthribidae	1	-	-	-	-	-	-
3119 Anthribidae	1	-	-	-	-	-	-
3126 Anthribidae	1	-	-	-	-	-	-
3181 Anthribidae	1	-	-	-	-	-	-
3185 Anthribidae	1	-	-	-	-	-	-
3231 Anthribidae	1	-	-	-	-	-	-
3239 Anthribidae	1	-	-	-	-	-	-
3265 Anthribidae	1	-	-	-	-	-	-
3271 Anthribidae	1	-	-	-	-	-	-
3279 Anthribidae	12	-	-	-	-	-	-
3283 Anthribidae	1	-	-	-	-	-	-
3288 Anthribidae	3	-	-	-	-	-	-
3293 Anthribidae	1	-	-	-	-	-	-
3309 Anthribidae	1	-	-	-	-	-	-
3327 Anthribidae	1	-	-	-	-	-	-
Anthribidae Gen.?	-	1	-	-	-	-	-
Anthribidae n. gen. nr. Allandrus	1	-	-	-	-	-	-
Anthribidae n. gen. nr. Brevibarra	4	-	-	-	-	-	-
Anthribidae sp. #2	1	1	-	-	-	-	-
Anthribidae sp. #3	1	-	-	-	-	-	-
Anthribidae sp. #4	1	-	-	-	-	-	-
Anthribidae sp. #7	1	-	-	-	-	-	-
Anthribidae sp. #14	2	-	-	-	-	-	-
Anthribidae sp. #18	1	-	-	-	-	-	-
Corrhecerus mixtus Jordon	54	-	-	-	-	-	-
Domaptolis championi Jordon	1	-	-	-	-	-	-
Eugonus decorus Jordon	14	-	-	-	-	-	-
Eugonus n. sp. nr. particolor Jordon	43	1	-	-	-	-	-
Eugonus subcylindricus Fahraeus	2	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Euparius nigritarsis Jordon	7	-	-	-	-	-	-
Euparius polius Jordon	22	-	-	-	-	-	-
Euparius sp. #1	2	1	-	-	-	-	-
Euparius sp. #5	1	-	-	-	-	-	-
Euparius sp. #8	1	-	-	-	-	-	-
Euparius sp. #9	4	-	-	-	-	-	-
Euparius sp. #19	4	-	-	-	-	-	-
Euparius sp. #20	1	-	-	-	-	-	-
Euparius sp. #21	3	1	-	-	-	-	-
Euparius stratus Jordon	4	-	-	-	-	-	-
Euparius suturalis Jordon	21	-	-	-	-	-	-
Euparius torquatus Jekel	-	-	-	-	2	-	-
Goniocloeus fractus Jordon	-	-	-	-	-	1	-
Gymnognathus scalaris Jordon	2	-	-	-	-	-	-
Gymnognathus sp. n. #1	3	-	-	-	-	-	-
Homocloeus sp. near xanthopus Jordon	-	-	-	-	-	1	-
Hypselotropis allatus Jordon	1	-	-	-	-	-	-
Ischnocerus aeneus Jordon	-	3	-	-	-	-	-
Ischnocerus sp. #1	-	-	1	-	-	-	-
Lagopezus inversus Jordon	1	-	-	-	-	-	-
Lagopezus tenuicornis Fabricius	3	-	-	-	-	-	-
Neanthribus apicalis Jordon	-	-	-	-	-	3	-
Neanthribus championi Jordon	-	-	-	-	1	-	-
Neanthribus pistor Jordon	2	1	-	-	-	-	-
Ormiscus sp. #1	-	-	-	-	1	-	-
Phaenithon curvipes (Germar)	5	-	-	-	-	-	-
Phaenithon discifer Jordon	2	-	-	-	-	-	-
Phaenithon sp.	3	-	-	-	-	-	-
Piezocorynus dimidiatus Jordon	2	-	-	-	-	-	-
Piezocorynus plagifer Jordon	6	-	-	-	-	-	-
Piezocorynus sp. #1	4	-	-	-	-	-	-
Piezocorynus sp. #2	1	-	-	-	-	-	-
Piezocorynus sp. #10	2	-	-	-	-	-	-
Piezocorynus sp. #12	1	-	-	-	-	-	-
Piezocorynus sp. #17	1	-	-	-	-	-	-
Ptychoderes brevis Jordon	118	-	-	-	-	-	-
Ptychoderes rugicollis Jordon	2	-	-	-	-	-	-
Ptychoderes tricostifrons Fahraeus	292	3	-	-	-	-	-
Stenocerus angulicollis Jekel	6	-	-	-	-	-	-
Stenocerus longulus Jekel	10	5	3	1	-	-	-
APIONIDAE							
Apion bicolor Gerstaecker	-	-	-	-	3	-	-
Apion "complex"	509	-	6	4	9	18	-
Apion costaricense Wagner	-	-	-	-	2	-	-
Apion cretaceicolle Sharp	91	-	-	-	-	-	-
Apion darlingtoni Kissinger	8	-	-	1	-	-	-
Apion grallarium Sharp	2	-	-	-	-	-	-
Apion hastifer Sharp	1	3	-	-	-	-	-
Apion inflatipenne Sharp	20	-	-	-	-	-	-
Apion lebasii Gyllenhal	29	-	-	-	-	-	-
Apion nodicorne Sharp	17	-	-	-	6	6	-
Apion peculiare Wagner	92	-	-	-	-	-	-
Apion sp. #1	6	1	-	-	-	2	-
Apion sp. #2	-	1	-	-	6	-	-
Apion sp. #3	-	1	-	-	-	-	-
Apion sp. #4	-	1	-	-	-	-	-
Apion sp. #6	-	1	-	-	-	-	-
Apion sp. #7	-	1	-	-	-	-	-
Apion sp. #8	-	2	-	-	-	-	-
Apion sp. #9	-	1	-	-	-	-	-
Apion sp. #10	-	-	-	-	1	-	-
Apion sp. #12	-	-	1	-	4	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Apion sp. #13	16	2	-	-	2	-	-
Apion sp. #14	80	1	3	-	-	-	-
Apion sp. #15	65	1	-	-	-	-	-
Apion sp. #16	-	-	-	1	-	21	-
Apion sp. #17	8	-	-	-	-	6	-
Apion sp. #18	2	-	-	-	-	1	-
Apion sp. #19	-	-	-	-	3	3	-
Apion sp. #20	1	-	-	-	1	-	-
Apion sp. #21	3	-	-	-	1	-	-
Apion sp. #22	2	-	-	-	-	1	-
Apion sp. #23	2	-	-	-	-	-	-
Apion sp. #24	-	-	1	1	-	-	-
Apion sp. #25	7	-	-	-	-	-	-
Apion sp. #26	1	-	-	-	-	-	-
Apion sp. #27	19	-	-	-	-	-	-
Apion sp. #28	2	-	-	-	-	-	-
Apion sp. #29	22	-	-	-	-	-	-
Apion sp. #30	1	-	-	-	-	-	-
Apion sp. #31	150	-	-	-	-	-	-
Apion sp. #33	2	-	-	-	-	-	-
Apion sp. #34	1	-	-	-	-	-	-
Apion sp. #35	1	-	-	-	-	-	-
Apion sp. #36	247	-	-	-	-	-	-
Apion sp. #37	1	-	-	-	-	-	-
Apion sp. #38	8	-	-	-	-	-	-
Apion sp. #40	2	-	-	-	-	-	-
Apion sp. #41	10	-	-	-	-	-	-
Apion sp. #42	1	-	-	-	-	-	-
Apion sp. #43	6	-	-	-	-	-	-
Apion sp. #44	4	-	2	-	-	-	-
Apion sp. #45	3	-	-	-	-	-	-
Apion sp. #46	1	-	-	-	-	-	-
Apion sp. #47	-	-	-	3	-	-	-
Apion sp. #48	-	-	-	1	-	-	-
Apion sp. #49	-	-	-	-	-	1	-
Apion sp. #50	-	-	-	-	1	-	-
Apion sp. #51	-	-	1	-	-	-	-
Apion sp. #52	-	-	1	-	-	-	-
Apion sp. #53	-	-	2	-	-	-	-
Apion sp. #54	-	-	4	-	-	-	-
Apion sp. #55	-	-	1	-	-	-	-
Apion sp. #56	-	-	2	-	-	-	-
Apion sp. #57	-	-	1	-	-	-	-
Apion sp. #58	-	-	1	-	-	-	-
Chrysapion auctum Sharp	1	-	-	-	-	-	-
Chrysapion chrysocomum (Gerstaecker)	-	2	-	-	-	-	-
ATTELABIDAE							
Attelabus sp. #1	1	-	-	-	-	-	-
Auletobius optatus Sharp	64	-	-	-	-	-	-
Auletobius sp. #1	-	-	-	-	-	1	-
Eugnamptus divisus Sharp	2	-	-	1	-	-	-
Eugnamptus godmani Sharp	-	-	-	-	2	-	-
Eugnamptus sp. #1	-	1	-	-	-	-	-
Eugnamptus sp. #2	-	-	-	-	1	-	-
Eugnamptus sp. #3	39	-	-	-	-	-	-
Eugnamptus sp. #4	6	-	-	-	-	-	-
Eugnamptus sp. #7	1	-	-	-	-	-	-
Eugnamptus sp. #8	1	-	-	-	-	-	-
Eugnamptus sp. #10	-	-	-	-	1	-	-
Eugnamptus sp. #11	-	-	-	-	1	-	-
Eugnamptus sp. #12	-	-	-	1	-	-	-
Eugnamptus sp. #13	-	-	-	-	-	-	2

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Euscelus sp. near breviceps (Sharp)	2	-	-	-	-	1	-
Hemilypus sp. #1	-	-	-	-	-	2	-
Pselaphorhynchites chiriquensis (Sharp)	-	-	-	-	4	-	-
Pseudauletes inermis (Sharp)	-	-	1	-	-	-	-
Rhynchites basalis Sharp	11	-	-	-	-	-	-
BRENTIDAE							
2154 Brentidae	3	-	-	-	-	-	-
2201 Brentidae	4	-	-	-	-	-	-
2287 Brentidae	1	-	-	-	-	-	-
2288 Brentidae	2	-	-	-	-	-	-
2332 Brentidae	6	-	-	-	-	-	-
Abactrus championi Sharp	2	-	-	-	-	1	-
Acratus sp. #1	1	1	-	-	-	-	-
Acratus sp. #2	29	-	-	4	-	-	-
Acratus sp. #3	1	-	-	-	-	-	-
Arrhenodes belti (Sharp)	-	1	-	-	-	-	-
Arrhenodes goudoti Kirsch	2	-	-	-	-	-	-
Arrhenodini belti (Sharp)	7	-	-	-	-	-	-
Arrhenodini sp. #4	1	-	-	-	-	-	-
Brentidae gen. #1; sp. #1	70	-	-	-	-	-	-
Brentus clavipes Sharp	1	-	-	-	-	-	-
Claeoderes bivittata Kirsch	10	-	-	-	-	-	-
Claeoderes sp. #1	1	-	-	-	-	-	-
Ephebocerus mexicanus Sharp	7	-	-	-	2	7	-
Hyperephanus hirtellus Erichson	61	-	1	-	-	-	-
Hyperephanus sp. #1	271	-	-	3	-	-	-
Nemobrenthus aeneipennis Sharp	1	-	-	-	-	2	-
Nemocephalus femoratus Sharp	4	-	1	-	-	-	-
Nemocephalus guatemalensis Sharp	13	-	-	-	-	-	-
Nemocephalus puncticeps Sharp	117	-	-	-	-	-	-
Nemocephalus sp. #1	8	-	-	-	-	-	-
Nemocoryna godmani Sharp	115	-	-	-	-	-	-
Nemocoryna sericata Sharp	169	-	-	-	-	-	-
Paratrachelizus adustus (Boheman)	9	-	-	-	1	16	-
Paratrachelizus aureopilosus (Senna)	54	5	-	1	-	-	-
Paratrachelizus cognatus (Sharp)	31	-	-	-	-	-	-
Paratrachelizus "complex"	-	-	20	2	-	-	-
Paratrachelizus elevatus (Sharp)	4	-	-	-	-	-	-
Paratrachelizus fracticornus (Sharp)	1	-	-	-	1	-	-
Paratrachelizus frontalis (Sharp)	20	2	-	-	-	-	-
Paratrachelizus robustus (Sharp)	15	-	-	-	-	-	-
Paratrachelizus sp. #1	194	34	-	-	1	-	-
Paratrachelizus sp. #2	23	-	-	-	1	16	-
Paratrachelizus sp. #3	5	-	-	-	-	-	-
Paratrachelizus sp. #4	6	1	-	-	-	-	-
Paratrachelizus turgidirostris Boheman	10	-	-	-	-	-	-
Proteramocerus sp. #1	35	-	-	-	-	-	-
Rhaphirhynchus sp. #1	1	-	-	-	-	-	-
Rhaphirhynchus sp. #2	2	-	-	-	-	-	-
Rhaphirhynchus sp. #3	1	-	-	-	-	-	-
Schoenfeldtia impressicollis Senna	22	-	-	1	-	-	-
Stereobates pedator Sharp	1	-	5	1	2	13	-
Stereobatinus efferus Kleine	2	-	-	-	-	-	-
Stereodermus barbirostris Sharp	11	-	-	-	-	-	-
Stereodermus breviceps Sharp	1	-	-	3	-	2	-
Stereodermus calvus Sharp	18	6	7	2	-	22	-
Stereodermus dentipennis Sharp	-	-	-	-	3	-	-
Stereodermus dentipes Sharp	44	-	-	-	-	-	-
Stereodermus filum complex	173	-	1	-	12	6	-
Stereodermus latirostris Sharp	27	-	9	3	-	8	-
Stereodermus pygmaeus Gyllenhal	50	6	3	-	-	-	-
Stereodermus sp. #3	4	14	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Stereodermus sp. #10	6	-	-	-	-	-	-
Stereodermus sp. #11	5	-	-	-	-	-	-
Stereodermus sp. #12	3	-	-	-	-	-	-
Stereodermus sp. #13	7	-	-	-	-	-	-
Stereodermus sp. #14	4	-	-	-	-	-	-
Stereodermus sp. #15	2	-	-	-	-	-	-
Stereodermus sp. #16	2	-	-	-	-	-	-
Stereodermus sp. #17	5	-	-	-	-	-	-
Stereodermus sp. #18	9	-	-	-	-	-	-
Stereodermus sp. nr. dentipes Sharp	-	-	-	6	-	1	-
Stereodermus sp. nr. puncticollis Sharp	-	-	-	1	-	-	-
Taphroderes apicalis Sharp	21	-	6	1	2	-	-
Taphroderes beltianus Sharp	-	-	-	1	5	-	-
Taphroderes oscillator Sharp	-	-	4	2	-	-	-
Taphroderes ventralis Sharp	20	-	-	-	-	-	-
Teramocerus belti Sharp	52	-	-	-	-	-	-
Trachelizini sp. #5	5	-	-	-	-	-	-
Trachelizus turgidirostris (Boh.)	-	-	-	-	1	-	-
Tychaeus myrmecophagus Herbst	21	-	-	-	-	-	-
Ulocerus sordidus Sharp	6652	1	-	-	-	-	-
Ulocerus sp. #1	-	-	-	-	-	2	-
CURCULIONIDAE							
ANTHONOMINAE							
Anthonomus caeruleisquamis Champion	1	-	-	-	-	-	-
Anthonomus calvescens Champion	14	-	-	-	-	-	-
Anthonomus excelsus Clark and Burke	13	-	-	-	-	-	-
Anthonomus flavirostris Champion	1	-	-	1	-	-	-
Anthonomus fortunatus Clark	-	-	-	-	-	2	-
Anthonomus marmoratus Champion	14	-	-	-	-	-	-
Anthonomus monostigma Champion	1	-	-	-	-	-	-
Anthonomus paleatus Champion	478	3	2	-	-	-	-
Anthonomus prodigiosus Clark	6	-	-	-	-	-	-
Anthonomus pruinosus Champion	1	-	-	-	-	-	-
Anthonomus sextuberculatus Champion	-	-	-	-	2	-	-
Anthonomus sp. #2	1	-	-	-	-	-	-
Anthonomus sp. #3	10	-	-	-	-	-	-
Anthonomus sp. #5	1	-	-	-	-	-	-
Anthonomus sp. #7	1	-	1	-	-	-	-
Anthonomus sp. #8	4	1	-	-	-	-	-
Anthonomus sp. #9	-	1	-	-	-	-	-
Anthonomus sp. #11	4	-	-	-	4	2	-
Anthonomus sp. #14	7	-	-	-	-	-	-
Anthonomus sp. #17	1	-	-	-	-	-	-
Anthonomus sp. #18	1	-	-	-	-	-	-
Anthonomus sp. #19	1	-	-	-	-	-	-
Anthonomus sp. #20	1	-	-	-	-	-	-
Anthonomus sp. #21	3	-	-	-	-	-	-
Anthonomus sp. #22	1	-	-	-	-	-	-
Anthonomus sp. #24	-	-	1	-	-	-	-
Anthonomus subparallelus Champion	3	-	-	-	-	-	-
Anthonomus sulcipygus Champion	4	-	-	-	-	-	-
Anthonomus triangularis Champion	1	-	-	-	-	-	-
Anthonomus triangulifer Champion	2	-	-	-	-	-	-
Anthonomus venustus Champion	2	-	-	-	-	-	-
Anthonomus veraepacis Champion	-	-	-	-	4	-	-
Atractomerus inaequalis Champion	-	-	-	-	-	1	-
Loncophorellus nitidus (Champion)	-	-	-	-	1	-	-
Loncophorus fortis (Champion)	38	1	-	-	-	-	-
Loncophorus fusiformis (Champion)	-	-	-	-	3	-	-
Loncophorus obliquus Chevrolat	41	-	-	-	-	-	-
Loncophorus santarosae (Clark)	4	1	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Melexerus hispidus (Champion)	-	1	1	-	-	-	-
Pseudanthonomus nucleon Clark	-	-	1	-	-	-	-
Pseudanthonomus tachyon Clark	272	1	-	-	-	-	-
BARIDINAE							
Baridinae Centrinini sp. #1	-	1	-	-	-	-	-
Baridinae sp. #2	-	1	-	-	-	-	-
Baridinae sp. #3	-	1	-	-	-	-	-
Baridinae sp. #4	-	-	-	-	-	5	43
Baridinae sp. #5	-	-	-	-	-	2	-
Baridinae sp. #6	-	-	-	-	-	1	-
Baridinae sp. #7	-	-	-	-	-	1	-
Baridinae sp. #8	-	-	-	-	-	1	-
Baridinae sp. #9	-	-	-	1	-	1	-
Baridinae sp. #10	34	-	-	-	-	-	-
Baridinae sp. #12	1	-	-	-	-	-	-
Baridinae sp. #13	5	-	-	-	-	-	-
Baridinae sp. #14	1	-	-	-	-	-	-
Baridinae sp. #15	1	-	-	-	-	-	-
Baridinae sp. #16	2	-	-	-	-	-	-
Baridinae sp. #17	1	-	-	-	-	-	-
Baridinae sp. #19	2	-	-	-	-	-	-
Baridinae sp. #21	1	-	-	-	-	-	-
Baridinae sp. #24	-	-	-	-	-	1	-
Baridinae sp. #25	-	-	-	-	-	1	-
Baridinae sp. #26	-	-	-	-	-	1	-
Baridinae sp. #27	-	-	-	1	-	-	-
Baridinae sp. #28	-	-	-	1	-	-	-
Baridinae sp. #29	-	-	-	2	-	-	-
Baridinae sp. #30	-	-	-	-	-	-	1
Buchananius carinifer (Champion)	71	-	-	43	-	6	-
Buchananius sp. #1	2	-	-	-	-	1	-
Buchananius sp. #2	-	-	-	1	-	-	1
Buchananius sp. #3	-	-	-	-	-	-	20
Buchananius sp. #4	-	-	-	-	-	-	7
Buchananius sp. #5	-	-	-	-	-	-	1
Cylindrocerus comma Schoenherr	1	-	-	-	-	-	-
Cylindrocerus glabripectus Champion	-	-	-	-	1	-	-
Cylindrocerus subulatus Champion	-	-	-	-	1	-	-
Cyrionyx scapulosus (Boheman)	-	-	-	-	1	-	-
Cyrionyx sp. #1	2	-	-	-	-	-	-
Cyrionyx sp. #2	-	-	-	-	-	1	-
Diorymerus laeviusculus Champion	-	-	-	1	-	-	-
Diorymerus longirostris Champion	1	-	-	-	-	-	-
Diorymerus sp. #10	-	-	-	-	1	-	-
Eugeraeus discifer Champion	-	-	-	1	-	-	-
Geraeus balaninoides Champion	-	-	-	-	1	-	-
Geraeus sp. #1	-	-	-	3	-	-	-
Geraeus sp. #3	-	-	-	-	1	-	-
Glyptobaris ugata Boheman	-	-	-	1	-	-	-
Iasides cincticollis Champion	-	-	-	1	-	-	-
Lamprobaris cucullata Champion	-	-	-	-	-	1	-
Lamprobaris sp. #1	-	-	-	-	-	1	-
Loboderes flavicornis Gyllenhal	5	-	-	-	-	-	-
Loboderes sulphureiventris Champion	1	-	-	-	-	-	-
Madarellus eruptus Champion	-	-	-	1	-	-	-
Parisoschoenus sp. #1	1	-	-	-	-	-	-
Plocamus clavisetis Champion	4	-	-	-	-	-	-
Pseudocentrinus sp. #1	1	-	-	-	-	-	-
Revena laevipennis Hustache	-	-	1	-	-	-	-
CAMAROTINAE							
Camarotus sp. #1	1	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
CERATOPODINAE							
Catiline sp. #1	2	-	-	-	-	-	-
Ceratopus bisignatus Boheman	65	2	1	1	-	-	-
Ceratopus longiclava Champion	4	-	-	-	-	-	-
Ceratopus sp. #1	8	-	-	-	12	3	-
Ceratopus sp. #2	101	-	-	-	-	-	-
Ceratopus sp. #3	12	-	-	-	-	-	-
Ceratopus sp. #5	-	-	-	-	2	-	-
Ceratopus sp. #6	-	-	-	-	7	-	-
Ceratopus sp. #8	-	-	-	-	-	10	-
Ceratopus sp. #9	-	-	-	-	-	2	-
Ceratopus sp. #11	1	-	-	-	1	2	-
Ceratopus sp. #12	-	-	-	-	-	6	-
Ceratopus sp. #13	-	-	-	-	1	-	-
Ceratopus sp. #14	-	-	-	-	1	-	-
Ceratopus sp. #15	7	-	-	-	-	-	-
Ceratopus sp. #16	76	-	-	-	-	-	-
Ceratopus sp. #17	1	-	-	-	-	-	-
Ceratopus sp. #18	1	-	-	-	-	-	-
Ceratopus sp. #19	4	-	-	-	-	-	-
Ceratopus sp. #20	-	-	3	-	-	-	-
Ceratopus sp. #21	-	-	2	-	-	-	-
Ceratopus sp. #22	-	-	1	-	-	-	-
Ceratopus sp. #23	-	-	5	-	-	-	-
Ceratopus sp. #24	-	-	-	-	-	1	-
Ceratopus tessellatus Champion	1	-	-	-	-	1	-
CEUTORHYNCHINAE							
Hypocoeliodes dietzi Champion	2	-	-	-	-	-	-
Hypocoeliodes sp. #1	-	-	-	1	-	-	-
COSSONINAE							
Acamptini n. gen. #1, sp. #1	8	2	-	-	-	-	-
Acamptini n. gen. #1, sp. #2	8	-	-	-	-	-	-
Acamptopsis encausta Champion	31	5	-	-	-	-	-
Acamptus plurisetosus (Champion)	20	7	3	-	-	-	-
Acamptus sp. #1	18	-	-	-	-	-	-
Acamptus sp. #2	-	-	-	1	-	-	-
Acamptus sp. #3	1	-	-	-	-	-	-
Acamptus verrucosus Voss	15	-	-	1	-	-	-
Anchacamptus mandli Voss	3	-	-	-	-	-	-
Caulophilus oryzae (Gyllenhal)	-	-	-	-	63	-	-
Caulophilus rufotestaceus (Champion)	-	-	-	125	-	-	-
Caulophilus sp. #1a	2	-	-	-	-	152	3
Caulophilus sp. #2	-	-	-	2	-	-	-
Caulophilus sp. #2a	-	-	-	-	1	5	-
Caulophilus sp. #3	-	-	-	1	-	-	-
Caulophilus sp. #3a	-	-	-	-	-	16	-
Caulophilus sp. #4	1	-	-	9	7	-	-
Caulophilus sp. #4a	2	-	-	-	-	1	-
Caulophilus sp. #5	-	-	-	2	1	-	-
Caulophilus sp. #5a	34	-	-	108	-	-	-
Caulophilus sp. #6a	21	-	-	-	-	-	-
Caulophilus sp. #7a	298	-	6	-	-	-	-
Caulophilus sp. #8a	-	-	32	15	-	-	-
Caulophilus sp. #9	-	-	-	27	-	-	-
Caulophilus sp. #9a	-	-	4	-	-	-	-
Caulophilus sp. #10	-	-	-	1	-	-	-
Caulophilus sp. #10a	3	-	-	-	1	2	-
Caulophilus sp. #11	-	-	-	1	-	-	-
Caulophilus sp. #12	-	-	-	1	-	-	-
Caulophilus sp. #13	15	-	27	1	-	-	-
Choerorrhynchus sp. #1	-	-	-	2	-	-	-
Cossoninae Rhyncolini sp. #2	3	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Cossoninae n. gen. #1; sp. #1	1450	31	99	44	-	-	-
Cossoninae n. gen. #2; sp. #1	391	15	81	59	-	1	-
Cossoninae n. gen. #3, sp. #1	-	-	-	2	-	207	-
Cossoninae sp. #3	5	-	21	-	-	-	-
Cossoninae sp. #4	86	-	2	-	-	-	-
Cossoninae sp. #5	-	-	-	11	-	-	-
Cossoninae sp. #6	-	-	-	1	-	450	-
Cossoninae sp. #7	-	-	-	2	-	-	-
Cossonus canaliculatus (Fabr.)	-	1	-	-	-	-	-
Cossonus planirostris Champion	-	-	-	-	1	-	-
Cossonus sp. #1	-	-	-	18	-	-	-
Cossonus sp. #2	-	-	-	1	-	-	-
Cossonus sp. #4	-	-	-	1	-	-	-
Cossonus sp. #5	-	-	-	-	-	-	111
Himatium sp. #1	33	-	1	-	-	-	-
Macrancyloides perlongus Champion	59	-	-	-	-	-	-
Micromimus continuus Champion	1	-	-	-	23	651	-
Micromimus dehiscens Champion	-	-	-	1	39	2	-
Micromimus minimus (Boheman)	900	385	78	109	65	1	-
Micromimus sp. #1	13	-	-	-	-	3	-
Micromimus sp. #2	17	-	2	6	-	40	-
Micromimus sp. #3	67	-	-	33	2	22	-
Micromimus sp. #6	4	-	-	-	1	-	-
Micromimus sp. #7	54	-	-	-	-	-	-
Micromimus sp. #8	4	-	-	-	-	-	-
Micromimus sp. #9	31	-	-	-	-	-	-
Micromimus sp. #10	-	-	7	-	-	-	-
Micromimus sp. #11	-	-	19	17	-	-	-
Micromimus sp. #12	-	-	-	2	-	-	-
Micromimus sp. #14	1	-	-	-	-	-	-
Micromimus sp. #15	-	-	-	-	1	-	-
Micromimus sp. #16	662	-	-	37	-	1	-
Micromimus sp. #17	237	-	-	9	-	1	-
Micromimus sp. #18	-	-	-	1	-	-	-
Micromimus sp. #19	-	5	-	-	-	-	-
Oocorynus corrosus Champion	-	-	-	14	-	-	-
Oocorynus sp. #1	625	-	-	20	-	-	-
Pentarthrum elumbis (Boheman)	-	-	-	4	-	-	-
Prionarthrus sp. #1	1	4	-	-	-	-	-
Prionarthrus sp. #2	7	-	-	-	-	-	-
Prionarthrus sp. #3	20	-	-	-	-	-	-
Prionarthrus sp. #4	39	-	-	-	-	-	-
Prionarthrus sp. #5	1	-	-	-	-	-	-
Pseudapotrepus macrophthalmus Champion	945	-	59	60	165	197	-
Pseudapotrepus sp. #1	1	-	-	-	29	429	-
Pseudapotrepus sp. #2	-	-	-	48	-	-	-
Pseudeucoptus macrocephalus Champion	-	-	-	-	-	1	-
Pseudopentarthrum sp. #1	2	-	-	-	1	-	-
Pseudopentarthrum sp. #2	3	-	-	-	-	-	-
Rhinanisus sp. #1	-	-	-	1	-	-	-
Rhinanisus sp. #3	-	-	-	1	-	-	-
Rhisanisus planatus Champion	7	-	-	-	-	10	-
Rhyncolini sp. #1	-	1	-	-	-	-	-
Stenancylus sp. #1	8	-	45	12	-	6	-
Stenomimus sp. #6	-	-	-	18	-	-	-
Stenomimus sp. #8	-	-	-	7	-	-	-
Stenomimus sp. #9	-	-	-	10	-	-	-
CRYPTORHYNCHINAE							
Acamptoides angustus Champion	19	-	-	-	-	-	-
Acamptoides sp. #1	64	-	-	-	-	-	-
Acamptoides sp. #3	-	5	-	-	-	-	-
Apteromechus deciduus Champion	2	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Apteromechus flavopuntatus Champion	41	-	-	-	-	-	-
Apteromechus nitidifrons Champion	60	4	-	-	-	-	-
Apteromechus opacifons Champion	8	-	-	-	-	-	-
Apteromechus parvus Champion	-	5	-	-	-	-	-
Apteromechus pigmentatus Champion	1	1	-	-	-	-	-
Apteromechus rugulifrons Champion	-	11	-	-	-	-	-
Apteromechus scabrosus Champion	6	-	-	-	-	-	-
Apteromechus sp. #3	53	1	-	-	-	-	-
Apteromechus sp. #4	-	2	-	-	-	-	-
Apteromechus sp. #5	-	2	-	-	-	-	-
Apteromechus sp. #6	2	3	-	-	-	-	-
Apteromechus sp. #7	5	15	-	-	-	-	-
Apteromechus sp. #8	76	1	-	-	-	-	-
Apteromechus sp. #9	2	-	-	-	-	-	-
Apteromechus sp. #10	-	3	-	-	-	-	-
Apteromechus sp. #11	-	12	-	-	-	-	-
Apteromechus sp. #12	2	1	-	-	-	-	-
Apteromechus sp. #13	1	-	-	-	-	-	-
Apteromechus sp. #14	2	-	-	-	-	-	-
Apteromechus sp. #15	5	-	-	-	-	-	-
Apteromechus sp. #16	4	-	-	-	-	-	-
Apteromechus sp. #19	1	-	-	-	-	-	-
Apteromechus sp. #20	33	-	-	-	-	-	-
Apteromechus sp. #21	3	-	-	-	-	-	-
Apteromechus sp. #22	1	-	-	-	-	-	-
Apteromechus sp. #23	21	-	-	-	-	-	-
Apteromechus sp. #25	15	-	-	-	-	-	-
Apteromechus sp. #26	1	-	-	-	-	-	-
Apteromechus sp. #27	12	-	-	-	-	-	-
Apteromechus sp. #28	-	-	-	1	-	-	-
Arthrocorynus dotatus Champion	21	-	-	-	-	-	-
Atrichis sp. #1	1	-	-	-	-	-	-
Atrichis sp. #2	1	-	-	-	-	-	-
Atrichis sp. #3	9	-	-	-	-	-	-
Bothrobatys laticollis Boheman	-	-	-	-	6	4	-
Coelosternus leporinus (Champion)	-	-	-	-	5	11	-
Coelosternus quadrifasciatus (Champion)	26	-	-	-	-	-	-
Coelosternus sp. nr. biolleyi (Champion)	-	-	-	-	-	7	-
Coelosternus variisquamis (Champion)	9	3	6	1	1	8	-
Cophes asperatus Champion	16	-	-	-	-	1	-
Cophes gibbus Champion	5	2	-	-	1	1	-
Cophes hieroglyphicus Champion	-	-	-	-	2	-	-
Cophes longiusculus (Boheman)	11	-	-	-	1	-	-
Cophes sp. #2	38	-	-	-	1	-	-
Cophes sp. #3	42	-	-	-	-	-	-
Cophes sp. #4	29	-	-	-	-	-	-
Cophes sp. #6	6	-	-	-	-	-	-
Cophes sp. #7	6	-	-	-	-	-	-
Cophes sp. #8	-	2	-	-	-	-	-
Cophes sp. #9	-	-	-	-	-	3	-
Cophes sp. #10	-	-	-	-	-	-	1
Cryptorhynchinae sp. #C1	-	46	-	-	-	-	-
Cryptorhynchinae sp. #C2	1	3	-	-	-	-	-
Cryptorhynchinae sp. #C4	14	2	-	-	-	-	-
Cryptorhynchinae sp. #C5	-	4	-	-	-	-	-
Cryptorhynchinae sp. #C7	3	2	-	10	-	-	-
Cryptorhynchinae sp. #C8	1	4	-	-	-	-	-
Cryptorhynchinae sp. #C9	-	5	-	-	-	-	-
Cryptorhynchinae sp. #C10	3	38	-	1	-	-	-
Cryptorhynchinae sp. #C11	134	9	-	-	-	2	-
Cryptorhynchinae sp. #C12	48	4	-	-	-	-	-
Cryptorhynchinae sp. #C13	8	3	-	-	-	-	-
Cryptorhynchinae sp. #C14	104	2	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Cryptorhynchinae sp. #C15	10	2	-	-	-	-	-
Cryptorhynchinae sp. #C16	4	2	-	-	-	-	-
Cryptorhynchinae sp. #C17	-	2	-	-	-	-	-
Cryptorhynchinae sp. #C18	-	17	-	-	-	-	-
Cryptorhynchinae sp. #C19	10	4	-	-	-	-	-
Cryptorhynchinae sp. #C21	126	8	-	-	-	-	-
Cryptorhynchinae sp. #C22	-	2	-	-	-	-	-
Cryptorhynchinae sp. #C23	29	1	-	-	-	-	-
Cryptorhynchinae sp. #C24	6	1	-	-	-	-	-
Cryptorhynchinae sp. #C25	6	6	-	-	-	-	-
Cryptorhynchinae sp. #C29	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C30	13	1	-	-	-	-	-
Cryptorhynchinae sp. #C31	10	1	-	-	-	-	-
Cryptorhynchinae sp. #C32	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C33	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C34	8	1	-	-	-	-	-
Cryptorhynchinae sp. #C35	5	1	-	-	-	-	-
Cryptorhynchinae sp. #C36	10	1	-	-	-	-	-
Cryptorhynchinae sp. #C37	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C38	14	1	-	-	-	-	-
Cryptorhynchinae sp. #C39	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C40	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C41	1	1	-	-	-	-	-
Cryptorhynchinae sp. #C43	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C44	-	2	-	-	-	-	-
Cryptorhynchinae sp. #C45	2	1	-	-	-	-	-
Cryptorhynchinae sp. #C46	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C47	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C48	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C49	11	3	-	-	-	-	-
Cryptorhynchinae sp. #C50	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C51	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C52	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C53	-	2	-	-	-	-	-
Cryptorhynchinae sp. #C54	-	1	-	-	-	-	-
Cryptorhynchinae sp. #C55	-	2	-	-	-	-	-
Cryptorhynchinae sp. #C57	11	-	-	-	11	-	-
Cryptorhynchinae sp. #C60	12	-	-	-	1	-	-
Cryptorhynchinae sp. #C61	-	-	-	-	1	-	-
Cryptorhynchinae sp. #C62	530	-	-	-	166	-	-
Cryptorhynchinae sp. #C63	-	-	-	-	9	-	-
Cryptorhynchinae sp. #C64	-	-	-	-	9	-	-
Cryptorhynchinae sp. #C65	73	-	-	-	5	-	-
Cryptorhynchinae sp. #C66	1242	-	-	-	-	-	-
Cryptorhynchinae sp. #C67	90	-	-	-	-	-	-
Cryptorhynchinae sp. #C68	83	-	-	-	-	-	-
Cryptorhynchinae sp. #C69	166	-	-	-	-	-	-
Cryptorhynchinae sp. #C70	7	-	-	-	-	-	-
Cryptorhynchinae sp. #C72	2	1	-	-	-	-	-
Cryptorhynchinae sp. #C74	1	1	-	-	-	-	-
Cryptorhynchinae sp. #C76	25	1	-	-	-	-	-
Cryptorhynchinae sp. #C77	2	1	-	-	-	-	-
Cryptorhynchinae sp. #C79	-	2	-	-	-	-	-
Cryptorhynchinae sp. #C80	-	2	-	-	-	-	-
Cryptorhynchinae sp. #C155	59	-	-	-	-	-	-
Cryptorhynchinae sp. #CR1	-	-	-	-	-	2	-
Cryptorhynchinae sp. #CR2	-	-	2	-	-	1	-
Cryptorhynchinae sp. #CR3	-	-	-	-	-	3	-
Cryptorhynchinae sp. #CR4	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR5	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR6	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR7	-	-	-	-	-	4	-
Cryptorhynchinae sp. #CR8	-	-	-	-	-	2	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Cryptorhynchinae sp. #CR10	-	-	-	-	-	20	-
Cryptorhynchinae sp. #CR12	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR13	9	-	-	-	-	8	-
Cryptorhynchinae sp. #CR15	-	-	-	-	-	11	-
Cryptorhynchinae sp. #CR17	-	-	-	-	-	2	-
Cryptorhynchinae sp. #CR19	-	-	-	-	1	11	-
Cryptorhynchinae sp. #CR20	-	-	-	-	-	2	-
Cryptorhynchinae sp. #CR22	-	-	-	-	-	3	-
Cryptorhynchinae sp. #CR24	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR25	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR26	-	-	-	-	-	5	-
Cryptorhynchinae sp. #CR27	-	-	-	-	-	18	-
Cryptorhynchinae sp. #CR28	-	-	-	-	-	6	-
Cryptorhynchinae sp. #CR29	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR30	-	-	-	-	-	25	-
Cryptorhynchinae sp. #CR31	1	-	-	2	-	3	-
Cryptorhynchinae sp. #CR32	-	-	-	-	-	2	-
Cryptorhynchinae sp. #CR33	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR34	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR35	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR36	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR38	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR39	-	-	-	-	-	5	-
Cryptorhynchinae sp. #CR40	1	-	-	-	-	4	-
Cryptorhynchinae sp. #CR41	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR43	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR44	3	-	-	-	-	1	-
Cryptorhynchinae sp. #CR45	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR46	-	-	-	-	-	17	-
Cryptorhynchinae sp. #CR47	-	-	-	-	8	1	-
Cryptorhynchinae sp. #CR48	-	-	-	-	-	2	-
Cryptorhynchinae sp. #CR49	-	-	-	-	-	2	-
Cryptorhynchinae sp. #CR50	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR51	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR52	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR53	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR54	-	-	-	-	-	2	-
Cryptorhynchinae sp. #CR55	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR56	7	1	-	-	-	19	-
Cryptorhynchinae sp. #CR57	-	-	-	-	-	6	-
Cryptorhynchinae sp. #CR58	-	-	-	-	20	-	-
Cryptorhynchinae sp. #CR60	-	-	-	-	1	-	-
Cryptorhynchinae sp. #CR61	-	-	-	-	2	-	-
Cryptorhynchinae sp. #CR62	2	-	-	-	3	1	-
Cryptorhynchinae sp. #CR63	-	-	-	-	2	-	-
Cryptorhynchinae sp. #CR64	-	-	-	-	2	-	-
Cryptorhynchinae sp. #CR66	-	-	-	-	2	-	-
Cryptorhynchinae sp. #CR68	60	-	-	-	-	-	-
Cryptorhynchinae sp. #CR69	43	-	-	-	-	-	-
Cryptorhynchinae sp. #CR70	22	-	-	-	-	-	-
Cryptorhynchinae sp. #CR75	9	2	-	-	-	-	-
Cryptorhynchinae sp. #CR77	-	-	-	6	-	-	-
Cryptorhynchinae sp. #CR79	-	-	-	14	-	-	-
Cryptorhynchinae sp. #CR80	-	-	-	3	-	-	-
Cryptorhynchinae sp. #CR82	-	-	1	15	-	-	-
Cryptorhynchinae sp. #CR84	-	-	-	1	-	-	-
Cryptorhynchinae sp. #CR85	-	-	-	5	-	-	-
Cryptorhynchinae sp. #CR89	6	-	-	-	-	-	-
Cryptorhynchinae sp. #CR90	7	-	-	-	-	-	-
Cryptorhynchinae sp. #CR91	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR92	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR93	7	-	-	-	-	-	-
Cryptorhynchinae sp. #CR94	16	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Cryptorhynchinae sp. #CR95	11	-	-	-	-	-	-
Cryptorhynchinae sp. #CR96	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR97	4	-	-	-	-	-	-
Cryptorhynchinae sp. #CR98	3	-	-	-	-	-	-
Cryptorhynchinae sp. #CR100	16	-	-	-	-	-	-
Cryptorhynchinae sp. #CR101	11	-	-	-	-	-	-
Cryptorhynchinae sp. #CR102	11	-	-	-	-	-	-
Cryptorhynchinae sp. #CR103	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR104	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR105	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR106	3	-	-	-	-	-	-
Cryptorhynchinae sp. #CR107	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR108	5	-	-	-	-	-	-
Cryptorhynchinae sp. #CR109	5	-	-	-	-	-	-
Cryptorhynchinae sp. #CR110	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR111	28	-	-	-	-	-	-
Cryptorhynchinae sp. #CR112	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR113	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR114	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR116	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR117	18	-	-	-	-	-	-
Cryptorhynchinae sp. #CR118	8	-	-	-	-	-	-
Cryptorhynchinae sp. #CR119	5	-	1	-	-	-	-
Cryptorhynchinae sp. #CR120	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR121	4	-	-	-	-	-	-
Cryptorhynchinae sp. #CR122	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR123	96	-	-	-	-	-	-
Cryptorhynchinae sp. #CR125	17	-	1	-	-	-	-
Cryptorhynchinae sp. #CR126	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR127	96	-	1	-	-	-	-
Cryptorhynchinae sp. #CR130	16	-	-	-	-	-	-
Cryptorhynchinae sp. #CR131	68	-	-	-	-	-	-
Cryptorhynchinae sp. #CR134	84	-	-	-	-	-	-
Cryptorhynchinae sp. #CR135	18	-	-	-	-	-	-
Cryptorhynchinae sp. #CR136	25	-	-	-	-	-	-
Cryptorhynchinae sp. #CR137	33	-	-	-	-	-	-
Cryptorhynchinae sp. #CR138	24	-	-	-	-	-	-
Cryptorhynchinae sp. #CR139	33	-	-	-	-	-	-
Cryptorhynchinae sp. #CR140	9	-	-	-	-	-	-
Cryptorhynchinae sp. #CR141	11	-	-	-	-	-	-
Cryptorhynchinae sp. #CR142	11	-	-	-	-	-	-
Cryptorhynchinae sp. #CR143	14	-	-	-	-	-	-
Cryptorhynchinae sp. #CR144	7	-	-	-	-	-	-
Cryptorhynchinae sp. #CR145	14	-	-	-	-	-	-
Cryptorhynchinae sp. #CR147	31	-	-	-	-	-	-
Cryptorhynchinae sp. #CR149	4	-	-	-	-	-	-
Cryptorhynchinae sp. #CR150	3	-	-	-	-	-	-
Cryptorhynchinae sp. #CR152	7	-	-	-	-	-	-
Cryptorhynchinae sp. #CR154	12	-	-	-	-	-	-
Cryptorhynchinae sp. #CR155	47	-	-	-	-	-	-
Cryptorhynchinae sp. #CR156	34	-	-	-	-	-	-
Cryptorhynchinae sp. #CR157	16	-	-	-	-	-	-
Cryptorhynchinae sp. #CR158	4	-	-	-	-	-	-
Cryptorhynchinae sp. #CR163	14	-	-	-	-	-	-
Cryptorhynchinae sp. #CR164	22	-	-	-	-	-	-
Cryptorhynchinae sp. #CR165	15	-	-	-	-	-	-
Cryptorhynchinae sp. #CR166	11	-	-	-	-	-	-
Cryptorhynchinae sp. #CR167	5	-	-	-	-	-	-
Cryptorhynchinae sp. #CR169	3	-	-	-	-	-	-
Cryptorhynchinae sp. #CR170	3	-	-	-	-	-	-
Cryptorhynchinae sp. #CR171	8	-	-	-	-	-	-
Cryptorhynchinae sp. #CR172	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR173	2	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Cryptorhynchinae sp. #CR174	3	-	-	-	-	-	-
Cryptorhynchinae sp. #CR175	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR176	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR177	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR178	3	-	-	-	-	-	-
Cryptorhynchinae sp. #CR179	21	-	-	-	-	1	-
Cryptorhynchinae sp. #CR180	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR181	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR182	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR183	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR184	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR185	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR187	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR188	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR189	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR190	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR191	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR192	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR193	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR196	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR197	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR198	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR199	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR200	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR202	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR203	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR204	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR205	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR206	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR207	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR209	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR210	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR211	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR212	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR213	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR214	4	-	-	-	-	-	-
Cryptorhynchinae sp. #CR215	4	-	-	-	-	-	-
Cryptorhynchinae sp. #CR216	2	-	-	-	-	-	-
Cryptorhynchinae sp. #CR217	3	-	-	-	-	-	-
Cryptorhynchinae sp. #CR218	5	-	-	-	-	-	-
Cryptorhynchinae sp. #CR220	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR221	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR222	1	-	-	-	-	-	-
Cryptorhynchinae sp. #CR223	1	-	1	-	-	-	-
Cryptorhynchinae sp. #CR224	1	-	1	-	-	-	-
Cryptorhynchinae sp. #CR225	-	-	-	-	1	-	-
Cryptorhynchinae sp. #CR226	-	-	-	-	1	-	-
Cryptorhynchinae sp. #CR227	-	-	-	-	1	-	-
Cryptorhynchinae sp. #CR228	-	-	-	-	1	-	-
Cryptorhynchinae sp. #CR229	-	-	1	55	-	-	-
Cryptorhynchinae sp. #CR230	-	-	1	-	-	-	-
Cryptorhynchinae sp. #CR231	-	-	1	-	-	-	-
Cryptorhynchinae sp. #CR232	-	-	1	-	-	-	-
Cryptorhynchinae sp. #CR233	-	-	1	6	-	-	-
Cryptorhynchinae sp. #CR234	-	-	-	1	-	-	-
Cryptorhynchinae sp. #CR235	-	-	6	4	-	-	-
Cryptorhynchinae sp. #CR236	-	-	-	3	-	-	-
Cryptorhynchinae sp. #CR237	-	-	-	1	-	-	-
Cryptorhynchinae sp. #CR238	-	-	-	1	-	-	-
Cryptorhynchinae sp. #CR239	-	-	-	1	-	-	-
Cryptorhynchinae sp. #CR240	-	-	-	1	-	-	-
Cryptorhynchinae sp. #CR241	-	-	-	1	-	-	-
Cryptorhynchinae sp. #CR242	-	-	-	3	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Cryptorhynchinae sp. #CR243	-	-	-	2	-	-	-
Cryptorhynchinae sp. #CR244	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR245	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR246	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR247	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR248	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR249	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR250	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR251	-	-	-	-	-	2	-
Cryptorhynchinae sp. #CR252	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR253	-	-	-	-	-	1	-
Cryptorhynchinae sp. #CR254	-	-	-	-	-	2	-
Cryptorhynchinae sp. #CR255	-	-	-	-	-	1	-
Cryptorhynchus aequalis (Champion)	4	-	-	-	-	-	-
Cryptorhynchus albopunctatus (Champion)	12	-	3	-	-	-	-
Cryptorhynchus alutaceus (Champion)	8	-	-	1	-	-	-
Cryptorhynchus atrosignatus (Champion)	-	-	-	-	-	1	-
Cryptorhynchus bifenestratus (Champion)	23	1	-	-	-	-	-
Cryptorhynchus bimaculatus (Champion)	9	-	-	1	1	-	-
Cryptorhynchus bioculatus (Champion)	105	14	1	7	-	-	-
Cryptorhynchus cancellatus (Champion)	8	2	-	-	-	-	-
Cryptorhynchus carinifer (Champion)	5	4	-	-	-	-	-
Cryptorhynchus cinctipes (Champion)	6	-	-	-	-	-	-
Cryptorhynchus cinereus (Champion)	-	-	1	-	-	-	-
Cryptorhynchus collabismoides (Champion)	-	-	-	-	51	-	-
Cryptorhynchus concentricus (Champion)	4	2	-	-	-	-	-
Cryptorhynchus consobrinus Rosenschoeld	1	4	3	-	-	-	-
Cryptorhynchus contaminatus (Champion)	3	-	-	-	-	-	-
Cryptorhynchus cordubensis (Champion)	7	-	-	-	-	-	-
Cryptorhynchus curtirostris (Champion)	21	-	-	6	-	-	-
Cryptorhynchus decoratus (Champion)	2	-	-	1	-	-	-
Cryptorhynchus degressus (Champion)	2	-	3	1	12	-	-
Cryptorhynchus degressus var. (Champion)	-	-	6	-	-	-	-
Cryptorhynchus disciger (Champion)	19	-	-	1	-	-	-
Cryptorhynchus disjunctus Champion	-	-	-	-	-	3	-
Cryptorhynchus duplaris Champion	5	2	1	2	-	-	-
Cryptorhynchus erraticus (Champion)	-	-	-	-	-	8	-
Cryptorhynchus eruptus (Champion)	-	4	-	-	-	-	-
Cryptorhynchus evanescens (Champion)	-	-	-	-	-	4	-
Cryptorhynchus ferox (Champion)	-	-	-	3	-	-	-
Cryptorhynchus formosus (Champion)	10	-	-	-	-	-	-
Cryptorhynchus foveatus Boheman	49	1	-	-	-	-	-
Cryptorhynchus foveifrons (Champion)	2	-	-	-	-	-	-
Cryptorhynchus fraterculus (Champion)	22	-	1	-	-	-	-
Cryptorhynchus furvus (Champion)	1	-	-	-	-	-	-
Cryptorhynchus fuscatus (Champion)	5	-	-	-	-	-	-
Cryptorhynchus humilis (Champion)	28	-	1	-	-	-	-
Cryptorhynchus ignobilis (Champion)	11	4	-	-	-	-	-
Cryptorhynchus infuscatus (Champion)	5	-	-	-	-	-	-
Cryptorhynchus interlitus (Champion)	3	-	-	-	-	-	-
Cryptorhynchus melanophthalmus (Champion)	-	3	-	-	-	-	-
Cryptorhynchus mesomelas (Champion)	1	-	-	-	-	-	-
Cryptorhynchus murinus (Champion)	106	-	1	-	-	-	-
Cryptorhynchus octonotatus (Champion)	-	-	-	-	6	-	-
Cryptorhynchus oculeus (Champion)	3	-	-	-	-	-	-
Cryptorhynchus paleatus (Champion)	3	-	-	-	-	-	-
Cryptorhynchus pallidisetis Champion	2	1	-	-	-	-	-
Cryptorhynchus plagiaticollis (Champion)	2	-	-	-	-	-	-
Cryptorhynchus plumipes (Boheman)	2	-	-	-	-	-	-
Cryptorhynchus propinquus (Champion)	-	-	-	-	6	-	-
Cryptorhynchus quadrisignatus (Champion)	2	4	-	-	-	-	-
Cryptorhynchus sedulus (Champion)	18	-	-	-	-	-	-
Cryptorhynchus simplex (Champion)	3	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Cryptorhynchus singularis (Champion)	1	-	-	-	-	-	-
Cryptorhynchus sp. near biollei Champion	-	-	-	-	-	1	-
Cryptorhynchus sp. nr. nigroplagiatus (Champion)	-	-	-	-	-	5	-
Cryptorhynchus stigmaticus Champion	107	-	-	-	-	-	-
Cryptorhynchus stigmatophorus Champion	-	-	-	-	-	1	-
Cryptorhynchus strigatus (Champion)	12	4	1	-	-	-	-
Cryptorhynchus subcaudatus (Champion)	-	-	-	-	1	-	-
Cryptorhynchus tirunculus Boheman	10	5	-	-	-	-	-
Cryptorhynchus tortuosus (Champion)	2	-	-	2	-	-	-
Cryptorhynchus uncipes (Champion)	7	-	-	-	2	-	-
Cryptorhynchus undulatus (Champion)	-	-	-	4	-	1	-
Cylindrocorynus dentipes Boheman	57	-	-	-	-	4	2
Diaporesis distincta Pascoe	3	-	3	-	-	-	-
Elpinus palmatus Champion	6	-	-	-	-	-	-
Elytrocoptus lemniscatus Boheman	-	1	-	-	-	-	-
Episcirrus propugnator (Gyllenhal)	31	3	-	-	-	-	-
Eubulomus multicostatus Champion	24	1	-	-	-	-	-
Eubulomus reflexirostris Champion	64	10	-	-	-	-	-
Eubulomus sp. #1	13	8	-	-	-	-	-
Eubulomus sp. #2	22	-	-	3	-	-	-
Eubulomus sp. #3	1	-	-	-	-	-	-
Eubulomus sp. #4	2	-	-	-	-	-	-
Eubulomus sp. #5	18	-	-	-	-	-	-
Eubulomus sp. #6	32	-	-	-	-	-	-
Eubulomus sp. #7	37	-	-	-	-	-	-
Eubulomus sp. #8	2	-	-	-	-	-	-
Eubulomus sp. #9	30	-	-	5	-	-	-
Eubulomus sp. #10	1	-	-	-	-	-	-
Eubulomus sp. #11	6	-	-	-	-	-	-
Eubulomus sp. #15	1	-	-	-	-	-	-
Eubulomus squamiventris Champion	1	-	-	-	-	-	-
Eubulopsis edentata Champion	4	1	-	-	-	-	-
Eubulus bifasciculatus Champion	37	5	-	-	-	-	-
Eubulus brevis (Rosenschoeld)	4	1	-	-	-	-	-
Eubulus carinifrons Champion	1	-	-	-	-	-	-
Eubulus circumlitus Champion	17	1	-	-	-	-	-
Eubulus coecus (Fabricius)	-	1	1	-	-	-	-
Eubulus crinitus Champion	1	6	-	-	-	-	-
Eubulus crispus Champion	1	5	-	1	-	-	-
Eubulus crispus var. Champion	15	2	-	-	1	-	-
Eubulus densus var. Champion	102	-	-	-	-	-	-
Eubulus discoideus Champion	-	-	-	-	1	-	-
Eubulus fulvodiscus Champion	4	-	-	-	2	-	-
Eubulus gracilicornis Champion	1	-	-	-	-	-	-
Eubulus ignifer Champion	1	-	-	-	-	-	-
Eubulus marcidus Champion	-	-	-	2	1	2	-
Eubulus melanotus Champion	1	-	-	-	-	-	-
Eubulus miser Champion	7	2	-	8	-	-	-
Eubulus moerens Champion	-	2	-	-	-	-	-
Eubulus nigricollis Champion	4	1	-	-	-	-	-
Eubulus nigrosignatus Champion	14	-	-	-	-	-	-
Eubulus niveipectus Hustache	3	1	-	-	-	-	-
Eubulus ocellatus Champion	1	-	-	-	-	-	-
Eubulus orthomastius (Germar)	-	1	-	-	-	-	-
Eubulus punctifrons Champion	15	6	1	-	-	-	-
Eubulus reticulatus Champion	17	-	-	1	-	-	-
Eubulus signaticollis Champion	29	4	-	-	4	-	-
Eubulus sp. #1	-	7	-	-	-	-	-
Eubulus sp. #3	11	6	-	-	-	-	-
Eubulus sp. #4	22	4	1	-	-	-	-
Eubulus sp. #6	42	1	-	-	-	-	-
Eubulus sp. #7	3	9	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Eubulus sp. #8	11	2	-	-	-	-	-
Eubulus sp. #9	3	1	-	-	-	-	-
Eubulus sp. #10	-	1	-	-	-	-	-
Eubulus sp. #11	1	1	-	-	-	-	-
Eubulus sp. #12	-	4	-	-	-	-	-
Eubulus sp. #13	-	1	-	-	-	-	-
Eubulus sp. #14	-	1	-	-	-	-	-
Eubulus sp. #15	-	2	-	-	-	-	-
Eubulus sp. #16	-	-	-	-	7	-	-
Eubulus sp. #17	85	-	-	-	-	-	-
Eubulus sp. #18	2	-	-	-	-	-	-
Eubulus sp. #19	3	-	-	-	-	-	-
Eubulus sp. #20	4	-	-	-	-	-	-
Eubulus sp. #21	4	-	-	-	-	-	-
Eubulus sp. #22	13	-	-	-	-	-	-
Eubulus sp. #23	5	-	-	-	-	-	-
Eubulus sp. #24	6	-	-	-	-	-	-
Eubulus sp. #25	1	-	-	-	-	-	-
Eubulus sp. #26	1	-	-	-	-	-	-
Eubulus sp. #27	1	-	-	-	-	-	-
Eubulus sp. #28	18	1	-	-	-	-	-
Eubulus sp. #30	6	-	-	-	-	1	-
Eubulus sp. #31	-	1	-	-	-	-	-
Eubulus sp. #32	-	1	-	-	-	-	-
Eubulus sp. #35	-	-	-	-	-	2	-
Eubulus sp. #37	2	-	-	-	-	-	-
Eubulus sp. #38	12	-	-	-	-	-	-
Eubulus sp. #39	1	-	-	-	-	-	-
Eubulus sp. #40	24	-	-	-	-	-	-
Eubulus sp. #41	1	-	-	-	-	-	-
Eubulus sp. #42	5	-	-	-	-	-	-
Eubulus sp. #43	24	-	-	-	-	-	-
Eubulus sp. #44	-	-	-	1	-	-	-
Eubulus sp. #45	7	-	-	-	-	-	-
Eubulus sp. #47	2	-	-	-	-	-	-
Eubulus sp. #49	1	-	-	-	-	-	-
Eubulus sp. #51	1	-	-	-	-	-	-
Eubulus sp. #52	1	-	-	-	-	-	-
Eubulus sp. #53	1	-	-	-	-	-	-
Eubulus sp. #54	1	-	-	-	-	-	-
Eubulus sp. #56	4	-	-	-	-	-	-
Eubulus sp. #57	2	-	-	-	-	-	-
Eubulus sp. #58	3	-	-	-	-	-	-
Eubulus sp. #59	1	-	-	-	-	-	-
Eubulus sp. #60	1	-	-	-	-	-	-
Eubulus sp. #61	3	-	-	-	-	-	-
Eubulus sp. #62	2	-	-	-	-	-	-
Eubulus sp. #63	1	-	-	-	-	-	-
Eubulus sp. #64	2	-	-	-	-	-	-
Eubulus sp. #65	1	-	-	-	-	-	-
Eubulus sp. #66	1	-	-	-	-	-	-
Eubulus sp. #67	1	-	-	-	-	-	-
Eubulus sp. #69	1	-	-	-	1	-	-
Eubulus sp. #70	1	-	-	-	-	-	-
Eubulus sp. #71	1	-	-	-	-	-	-
Eubulus sp. #72	2	-	-	-	-	-	-
Eubulus sp. #74	-	-	-	1	-	-	-
Eubulus sp. #75	-	-	-	1	-	-	-
Eubulus stipator (Boheman)	2	-	-	-	-	-	-
Eubulus truncatus Champion	8	1	1	2	-	-	-
Eubulus unidentatus Champion	-	-	1	3	-	-	-
Euscepes longisetis Champion	-	-	-	-	1	-	-
Eutinobothrus pilosellus (Boheman)	2	2	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Faustinus apicalis (Faust)	-	1	-	-	-	-	-
Hemiliopsis nudicollis (Chevrolat)	200	26	17	10	5	118	-
Isus mnigrum Champion	147	-	-	-	-	-	-
Leiomerus glabrirostris (Boheman)	-	-	2	-	-	-	-
Macromeropsis binotata Champion	4	-	-	-	-	-	-
Macromerus numenius Erichson	3	-	-	-	-	-	-
Macromerus numenius succinctus Chevrolat	7	-	-	-	1	1	-
Macromerus sp. #1	-	-	-	-	-	1	-
Mantias gracilitarsis Champion	-	-	1	1	81	15	-
Merocnemus horni Faust	1	1	-	-	-	-	-
Metadupus nodatus Boheman	-	-	-	-	-	1	-
Metraniella nigrolineata Champion	6	-	-	1	-	-	-
Metraniella sp. #1	-	1	-	-	-	-	-
Metraniella sp. #2	2	-	-	-	-	-	-
Metriophilus cribricollis Champion	2	-	-	-	-	-	-
Metriophilus definitus (Rosenschoeld)	1	-	-	-	-	-	-
Metriophilus fugax Champion	31	5	3	1	14	7	-
Metriophilus horridulus Champion	109	128	-	-	1	-	-
Metriophilus minimus Champion	200	9	-	3	-	-	-
Metriophilus miscellus Champion	-	-	-	-	2	-	-
Metriophilus nigroterminatus Champion	3	-	-	-	-	-	-
Metriophilus nitidus Champion	9	7	-	-	-	-	-
Metriophilus occultus Champion	1	-	-	-	-	-	-
Metriophilus ramosus Champion	-	-	-	1	-	-	-
Metriophilus ramulosus Champion	9	1	-	-	-	-	-
Metriophilus rugifrons Champion	4	-	-	-	-	-	-
Metriophilus sp. #2	1	7	-	-	-	-	-
Metriophilus sp. #3	9	8	-	-	-	-	-
Metriophilus sp. #4	-	1	-	-	-	-	-
Metriophilus sp. #5	2	1	-	-	-	-	-
Metriophilus sp. #6	21	-	2	-	3	1	-
Metriophilus sp. #7	72	-	-	-	1	-	-
Metriophilus sp. #8	-	-	-	-	-	3	-
Metriophilus sp. #9	-	-	-	-	-	6	-
Metriophilus sp. #10	-	-	-	-	1	-	-
Metriophilus sp. #11	-	-	-	-	4	-	-
Metriophilus sp. #12	-	-	-	-	1	-	-
Metriophilus sp. #14	-	-	-	1	-	-	-
Metriophilus sp. #15	-	-	-	9	-	-	-
Metriophilus sp. #16	3	-	-	19	-	-	-
Metriophilus sp. #17	6	-	-	10	-	-	-
Metriophilus sp. #21	2	-	-	-	-	-	-
Metriophilus sp. #22	130	-	-	-	-	-	-
Metriophilus sp. #23	3	-	-	-	-	-	-
Metriophilus sp. #24	2	-	-	-	-	-	-
Metriophilus sp. #25	13	-	-	-	-	-	-
Metriophilus sp. #26	1	-	-	3	-	-	-
Metriophilus sp. #27	1	-	-	-	-	1	-
Metriophilus sp. #28	2	-	-	-	-	-	-
Metriophilus sp. #29	1	-	-	-	-	-	-
Metriophilus sp. #30	-	-	1	-	-	-	-
Metriophilus sp. #31	12	-	-	-	-	-	-
Metriophilus v-fulvum Champion	3	1	-	-	-	-	-
Microxypterus binotatus Champion	8	-	1	-	-	2	-
Microxypterus suturalis Champion	15	1	1	-	-	-	-
Oxypteropsis armata Champion	-	-	2	-	-	-	-
Oxytenopterus asper Boheman	-	-	1	1	-	-	-
Oxytenopterus clotho (Kirsch)	5	1	-	1	-	-	-
Oxytenopterus obliquus (Champion)	-	-	-	-	-	4	-
Oxytenopterus sp. #1	7	-	-	-	-	-	-
Oxytenopterus torvidus (Faust.)	-	2	-	-	-	-	-
Phalias laticrus Champion	100	-	5	1	-	-	-
Philonis inermis Champion	-	1	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Phyrdenus divergens (Germar)	-	6	-	-	-	-	-
Phyrdenus setiferus (Boheman)	2	30	-	-	-	-	-
Phyrdenus subnotatus (Boheman)	1	1	-	-	-	-	-
Pisaeus complanatus Champion	3	-	-	-	-	204	-
Pisaeus sp. #1	-	-	-	2	1	15	-
Pisaeus sp. #2	25	-	-	-	-	-	-
Pisaeus sp. #3	-	-	-	1	1	4	-
Pisaeus sp. #4	2	-	-	-	-	29	-
Pisaeus sulcatus Champion	9	-	-	2	2	53	-
Pisaeus varicus Champion	32	-	-	13	-	24	-
Pseudomopsis bicristata Champion	1	-	-	-	-	-	-
Pseudomopsis distigma Champion	-	-	2	-	-	-	-
Pseudomopsis notaticollis Champion	-	-	-	2	-	17	-
Pseudomopsis similis Champion	-	-	10	-	-	-	-
Pseudomopsis sp. #1	7	-	1	4	1	-	-
Pseudomopsis sp. #3	-	-	-	-	-	2	-
Pseudomopsis sp. #4	75	-	-	-	-	-	-
Pseudomopsis sp. #5	10	-	-	-	-	-	-
Pseudomopsis sp. #6	3	-	-	-	-	-	-
Pseudomopsis sp. #8	1	-	-	-	4	-	-
Pseudomopsis sp. #9	3	-	-	-	-	-	-
Pseudomopsis sp. #10	-	-	-	-	1	-	-
Pseudomopsis sp. #12	-	-	-	-	-	1	-
Pseudomopsis sp. #13	-	-	-	-	-	1	-
Pseudomopsis sp. #14	3	2	-	-	-	-	-
Pseudomopsis sp. #15	-	-	-	-	1	-	-
Ptous sp. #1	35	-	-	-	-	-	-
Ptous sp. #2	-	-	1	-	-	2	-
Rhinochenus stigma (Linnaeus)	2	-	-	-	-	-	-
Rhinochenus transversalis Chevrolat	2	-	-	-	-	-	-
Scedasus muricatus Champion	8	-	1	-	-	-	-
Semnorhynchus fulvopictus (Champion)	58	5	1	4	-	-	-
Semnorhynchus planirostris (Champion)	93	7	-	-	-	-	-
Semnorhynchus sp. #1	16	-	1	-	-	-	-
Semnorhynchus sp. #2	-	-	-	2	-	-	-
Semnorhynchus tristis (Champion)	5	11	-	-	-	-	-
Siron exornatus (Boheman)	9	-	-	-	-	-	-
Staseas granulatus Champion	11	-	-	-	-	5	-
Staseas granulatus var. Champion	33	-	-	-	-	-	-
Staseas mexicanus Champion	-	3	-	-	-	-	-
Staseas sp. #1	-	-	-	-	7	3	-
Staseas sp. #2	-	-	-	-	4	-	-
Staseas sp. #3	79	-	-	4	-	-	-
Staseas sp. #5	4	-	-	-	-	-	-
Staseas sp. #6	39	-	-	1	-	-	-
Staseas sp. #10	-	1	-	-	-	-	-
Staseas sp. #11	1	2	-	-	-	-	-
Sternocoelus acutidens (Champion)	-	-	-	-	12	-	-
Sternocoelus erubescens (Champion)	3	1	-	-	-	1	-
Sternocoelus multidentatus (Fiedler)	2	-	-	-	-	-	-
Sternocoelus sp. #1	-	-	-	-	1	-	-
Sternocoelus sp. #2	1	-	-	-	-	-	-
Sternocoelus sp. #3	2	-	-	-	-	-	-
Sternocoelus sp. #4	-	-	1	-	-	-	-
Sternocoelus sp. #5	-	-	-	-	-	1	2
Sternocoelus tardipes (Boheman)	5	6	2	1	-	-	-
Trachalus micronychus Champion	17	-	-	-	-	-	-
Tyloderma aeneotinctum Champion	1	-	36	-	-	-	-
Tyloderma circumcaribbeum Wibmer	-	-	2	-	-	-	-
Tyloderma expansum Wibmer	-	-	1	-	-	-	-
Tyloderma hustachei Wibmer	2	-	-	-	-	-	-
Tyloderma lepidogramma Wibmer	7	-	-	-	-	-	-
Tyloderma pilosellum (Chevrolat)	4	1	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Tyloderma variabile Wibmer	2	-	-	-	-	-	-
Tyrannion albosignatum Champion	1	-	-	-	-	-	-
Tyrannion breviculum Champion	-	-	-	2	-	2	-
Tyrannion imbelle Champion	-	-	-	2	-	11	-
Tyrannion nigrosellatum Champion	-	-	1	-	-	3	-
Tyrannion scabidum Champion	-	-	-	1	-	-	-
Tyrannion sp. #1	-	-	-	-	1	-	-
Tyrannion sp. #2	-	-	-	-	4	-	-
Tyrannion sp. #3	-	-	-	-	2	-	-
Tyrannion sp. #4	-	-	-	-	-	1	-
Tyrannion sp. #6	-	-	-	-	-	2	-
Tyrannion sp. #9	-	-	-	1	1	2	-
Tyrannion sp. #10	27	-	-	-	5	-	-
Tyrannion sp. #11	2	-	-	-	-	-	-
Tyrannion sp. #12	-	-	-	2	-	-	-
Tyrannion sp. #14	1	-	-	-	-	-	-
Tyrannion sp. #15	3	-	-	-	-	-	-
Tyrannion sp. #16	1	-	-	-	-	-	-
Tyrannion sp. #17	1	-	-	-	-	-	-
Tyrannion sp. #18	1	-	-	-	-	-	-
Tyrannion sp. #19	4	-	-	-	-	-	-
Tyrannion sp. #20	-	-	-	-	4	-	-
Tyrannion sp. #21	-	-	-	-	1	-	-
Tyrannion sp. #22	-	-	1	-	-	-	-
Tyrannion sp. #23	-	-	-	-	-	2	-
Tyrannion sp. #24	-	-	-	-	-	1	-
Tyrannion sp. #25	-	-	-	-	-	1	-
Tyrannion sp. #26	-	-	-	-	-	2	1
Tyrannion sp. #27	-	-	-	2	-	-	2
Tyrannion sp. #28	2	-	-	-	-	-	-
Tyrannion sp. #29	-	-	-	-	-	-	1
Tyrannion sp. #30	-	-	-	-	-	-	1
Tyrannion sp. #31	-	-	-	-	-	-	1
Tyrannion sp. nr. tricristatum Champion	-	-	-	-	-	-	1
Tyrannion tricristatum Champion	-	-	-	-	-	1	-
Tyrannion validus Champion	-	-	-	1	-	-	-
Ulosominus sp. #1	18	-	-	-	-	-	-
Ulosomus sp. #1	37	-	-	3	-	-	-
Zascelis brevicollis Champion	17	-	-	-	-	-	-
Zascelis consputa (Boheman)	1	2	10	-	-	-	-
Zascelis rugosa Champion	-	-	-	-	1	-	-
Zascelis sp. #1	1	-	-	-	19	1	-
Zascelis sp. #2	-	-	-	-	1	-	-
Zascelis sp. #3	-	-	-	-	1	-	-
Zascelis sp. #4	5	17	-	-	-	-	-
Zascelis sp. #5	1	-	-	-	-	-	-
CURCULIONINAE							
Terires "complex"	8821	-	3	7	-	-	-
Terires pilosus Champion	68	13	-	-	-	-	-
Terires plurisetosus Champion	-	125	-	-	-	-	-
DRYOPHTHORINAE							
Dryophthorus americanus Bedel	13	-	-	-	-	-	-
Dryophthorus sp. #1	1	-	-	25	-	-	-
Stenommatus sp. #1	16	-	13	126	-	1	-
Stenommatus sp. #2	-	-	-	29	-	-	-
Stenommatus sulcifrons Champion	-	-	2	30	-	524	3
ENTIMINAE							
Hypoptus macularis Champion	2	1	-	-	-	-	-
Promecops unidentata Champion	-	7	-	-	-	-	-
ERIRHININAE							
Anchylorhynchus bicarinatus O'Brien	2	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Anchylorhynchus sp. #1	649	-	-	-	-	-	-
Andranthobius palmarum (Champion)	64	240	-	-	-	1	-
Andranthobius sp. #1	1259	-	-	-	-	-	-
Brachybamus sp. #1	3	1	-	-	-	-	-
Celetes attaleae (Champion)	2	-	-	-	-	-	-
Celetes sp. #1	730	43	-	-	-	-	-
Celetes sp. #2	1	-	-	-	-	-	-
Cotithene sp. #1	-	-	-	-	-	-	8
Cyrtobagous singularis Hustache	156	-	-	-	-	-	-
Derelomini sp. #1	-	-	-	-	6	-	-
Derelomini sp. #2	18	-	6	-	-	-	-
Derelomini sp. #3	5	-	-	-	-	-	-
Derelomini sp. #4	14	-	-	-	-	-	-
Derelomini sp. #5	29	-	-	6	-	-	-
Derelomini sp. #6	-	-	3	-	-	-	-
Derelomini sp. #7	-	-	1	-	-	-	-
Derelomini sp. #8	-	-	-	-	-	2	-
Derelomini sp. #9	-	-	-	1	-	-	-
Erirrhininae gen. #1; sp. #1	12	-	-	-	-	-	-
Erirrhininae gen. #2; sp. #1	6	-	-	-	-	-	-
Grypidiopsis variegata Champion	-	1	-	-	-	-	-
Helodytes foveolatus (Duval)	7	1	-	-	-	-	-
Helodytes litus Kuschel	1	1	-	-	-	-	-
Lissorhoptrus isthmicus Kuschel	2	7	16	-	-	-	-
Neochetina eichhorniae Warner	209	-	-	-	-	-	-
Notiodes sp. #1	1	-	-	-	-	-	-
Notiodes sp. aeratus LeConte complex)	-	3	-	-	-	-	-
Ochetina bruchi Hustache	18	-	-	-	-	-	-
Ochetina induta Champion	1	-	-	-	-	-	-
Onychylis meridionalis Champion	3	-	452	-	-	-	-
Onychylis setiger Champion	1	-	-	-	-	-	-
Penestes sp. #1	-	-	-	-	-	-	1
Phyllotrox "complex"	43121	474	2564	115	29	204	3
Phyllotrox marcidus Champion	-	-	-	-	54	-	-
Phyllotrox sp. #2	-	-	-	-	-	1	-
Phyllotrox sp. #4	3	-	-	-	3	-	-
Phyllotrox sp. #5	1	-	-	-	4	-	-
Phyllotrox sp. #6	1	-	-	-	5	-	-
Phyllotrox sp. #7	-	-	-	-	1	-	-
Phyllotrox sp. #8	-	-	-	-	-	59	-
Phyllotrox sp. #9	-	-	-	-	-	2	-
Phyllotrox sp. #10	-	-	-	7	-	3	-
Phyllotrox sp. #11	-	-	-	3	-	1	-
Phyllotrox sp. #12	-	-	-	-	-	1	-
Phyllotrox sp. #13	-	-	-	-	-	4	-
Phyllotrox sp. #14	1	-	-	-	1	-	-
Phyllotrox sp. #15	1	-	-	-	-	-	-
Phyllotrox sp. #16	-	-	2	-	-	-	-
Phyllotrox sp. #17	-	-	-	1	-	1	-
Phyllotrox sp. #19	-	-	-	1	-	-	-
Phyllotrox sp. #20	-	-	-	-	-	-	16
Phytotribus sp. #1	1	2	-	-	-	-	-
Pistiacola cretatus (Champion)	3	-	-	-	-	-	-
Scybis pubescens Champion	434	3	-	-	-	-	-
Terioltes circumdatus Champion	-	-	-	-	1	2	22
Terioltes sp. #1	-	-	-	322	-	64	-
Terioltes sp. #2	-	-	-	123	-	53	-
Terioltes sp. #3	-	-	-	-	-	-	25
EUGNOMINAE							
Udeus eugnomoides Champion	1	1	-	1	-	-	-
Udeus sp. #1	-	3	-	-	-	-	-
Udeus sp. #2	12	10	5	-	-	-	-
Udeus sp. #3	-	-	2	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
HYPERINAE							
Larinosomus isthmica (Champion)	40	1	-	-	1	-	-
Phelypera distigma (Boheman)	21	6	1	-	-	-	-
MAGDALIDINAE							
Laemosaccus sculpturatus Champion	2	-	-	-	-	-	-
MOLYTINAE							
Aeatus costulatus Champion	114	-	-	-	-	-	-
Aeatus ebeninus Champion	4	10	-	-	-	-	-
Aeatus sp. #1	8	3	-	-	-	-	-
Aeatus sp. #2	5	1	-	-	-	-	-
Aeatus sp. #3	6	-	-	-	-	-	-
Aeatus sp. #4	2	-	-	-	-	-	-
Aeatus sp. #5	2	-	-	-	-	-	-
Anchonus sp. #1	-	-	-	-	-	1	-
Anchonus sp. #2	-	-	1	-	-	-	-
Arniticus sp. #1	-	-	-	1	4	-	-
Arniticus sp. #2	7	3	-	-	-	-	-
Arniticus sp. #3	-	-	-	-	-	6	-
Arniticus sp. #4	-	-	-	-	-	-	1
Chalcodermus angulicollis Fahraeus	-	1	-	-	-	-	-
Chalcodermus calidus (Fabricius)	24	6	-	-	-	-	-
Chalcodermus curvipes Champion	13	-	-	-	-	1	-
Chalcodermus dentipes Champion	10	4	-	-	-	1	-
Chalcodermus ovalis Fiedler	18	-	-	-	-	-	-
Chalcodermus radiatus Champion	-	2	-	-	-	-	-
Chalcodermus serripes Fahraeus	-	2	-	-	-	-	-
Chalcodermus sp. #1	37	-	-	-	-	-	-
Chalcodermus sp. #2	39	-	-	-	-	-	-
Chalcodermus sp. #3	6	-	-	-	-	-	-
Chalcodermus variolosus Champion	36	22	-	-	-	-	-
Chalcodermus vittatus Champion	1	1	-	-	-	-	-
Cholus canescens Pascoe	-	-	-	-	-	1	-
Cleogonus armatus Champion	15	5	-	1	-	-	-
Cleogonus fratellus Fiedler	22	7	-	-	-	-	-
Cleogonus rubetra (Fabricius)	57	1	-	-	-	-	-
Conotrachelus albifrons Champion	-	-	-	-	1	-	-
Conotrachelus albolineatus Champion	1	8	-	-	-	-	-
Conotrachelus alborosaceus Fiedler	12	-	-	-	-	1	-
Conotrachelus annulipes Champion	-	-	-	-	-	2	-
Conotrachelus arachnoides Champion	51	-	5	-	-	-	-
Conotrachelus aristatus Champion	296	10	-	-	-	-	-
Conotrachelus bilineatus Champion	-	-	-	-	-	9	-
Conotrachelus brevisetis Champion	101	5	-	-	-	32	-
Conotrachelus ciliatus Champion	-	-	-	-	5	1	-
Conotrachelus compressus Champion	4	2	-	-	-	-	-
Conotrachelus constrictus Champion	-	-	-	-	-	23	-
Conotrachelus continuus Champion	50	7	-	-	-	-	-
Conotrachelus crenatus Champion	-	-	-	-	125	21	-
Conotrachelus cristatus Fahraeus	-	86	27	3	-	-	-
Conotrachelus curtirostris Champion	4	-	-	-	-	-	-
Conotrachelus curvicostatus Marshall	42	3	4	-	-	-	-
Conotrachelus dentiferus Fahraeus	9	-	-	-	1	-	-
Conotrachelus dentimanus Champion	86	95	-	-	-	-	-
Conotrachelus deplanatus Champion	16	-	8	-	-	-	-
Conotrachelus diaconitus (Klug)	76	-	-	-	-	-	-
Conotrachelus divirgatus Champion	-	-	-	-	7	-	-
Conotrachelus divisus Champion	-	-	-	-	4	-	-
Conotrachelus extrusus Champion	-	1	-	-	-	-	-
Conotrachelus fasciculatus Champion	-	-	-	-	-	4	-
Conotrachelus flavangulus Champion	-	-	2	-	-	-	-
Conotrachelus flexuosus Champion	120	6	-	-	-	-	-
Conotrachelus foveicollis Champion	-	3	3	1	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Conotrachelus fulvescens Champion	-	-	-	-	117	28	-
Conotrachelus fulvibasis Champion	-	-	-	-	-	9	-
Conotrachelus fulvopictus Champion	-	4	-	-	49	-	-
Conotrachelus gibbirostris Champion	-	-	-	-	-	1	-
Conotrachelus incanus Champion	-	-	-	-	-	1	-
Conotrachelus inexplicatus Faust	7	-	-	-	1	11	-
Conotrachelus lateralis Champion	21	2	-	-	-	-	-
Conotrachelus latirostris Champion	2	-	-	-	3	1	-
Conotrachelus leucocephalus Champion	9	-	-	-	3	-	-
Conotrachelus longipennis Champion	-	-	-	-	2	-	-
Conotrachelus longirostris Champion	-	-	-	-	6	-	-
Conotrachelus multituberculatus (Fabr.)	1	3	2	-	-	-	-
Conotrachelus obliquelineatus Champion	57	-	7	-	-	-	-
Conotrachelus parvulus Champion	6	57	-	-	-	-	-
Conotrachelus picticollis Champion	-	-	-	-	-	55	-
Conotrachelus planifrons Champion	207	365	-	-	34	-	-
Conotrachelus punctiventris Champion	178	13	-	-	9	8	-
Conotrachelus quadrinodosus Champion	37	2	-	-	1	-	-
Conotrachelus quadrinotatus Fahraeus	13	-	-	-	-	1	-
Conotrachelus quadripustulatus Champion	-	-	-	-	-	-	1
Conotrachelus rectirostris Champion	-	1	5	-	-	5	-
Conotrachelus robustus Champion	-	-	-	-	1	38	-
Conotrachelus rubidus Champion	153	-	-	-	-	-	-
Conotrachelus scapularis Fahraeus	1	1	-	-	-	-	-
Conotrachelus semirufus Champion	420	18	-	-	19	6	-
Conotrachelus serpentinus (Klug)	2	-	-	-	-	1	-
Conotrachelus sextuberculatus Champion	-	15	-	-	-	-	-
Conotrachelus signatus Kirsch	-	-	-	-	3	-	-
Conotrachelus sinuaticollis Champion	-	17	-	-	-	-	-
Conotrachelus sobrinus Boheman	101	58	-	-	-	-	-
Conotrachelus sp. #1	2	14	-	-	-	-	-
Conotrachelus sp. #2	138	19	-	-	-	-	-
Conotrachelus sp. #4	2	21	-	-	1	-	-
Conotrachelus sp. #5	-	1	-	-	-	-	-
Conotrachelus sp. #6	80	2	-	-	-	-	-
Conotrachelus sp. #7	9	3	-	-	-	-	-
Conotrachelus sp. #8	-	1	-	-	-	-	-
Conotrachelus sp. #9	11	3	-	-	-	-	-
Conotrachelus sp. #10	-	3	-	-	-	-	-
Conotrachelus sp. #11	43	12	-	-	-	-	-
Conotrachelus sp. #12	-	6	-	-	-	-	-
Conotrachelus sp. #14	3	2	-	-	-	-	-
Conotrachelus sp. #16	8	5	-	-	-	-	-
Conotrachelus sp. #18	3	3	-	-	-	-	-
Conotrachelus sp. #19	-	1	-	-	-	-	-
Conotrachelus sp. #20	-	12	-	-	-	-	-
Conotrachelus sp. #21	2	7	-	-	-	-	-
Conotrachelus sp. #22	100	21	-	1	-	-	-
Conotrachelus sp. #23	26	2	-	-	-	-	-
Conotrachelus sp. #24	-	1	-	-	-	-	-
Conotrachelus sp. #25	759	2	-	-	-	-	-
Conotrachelus sp. #26	1	7	-	-	-	5	-
Conotrachelus sp. #27	-	1	-	-	-	-	-
Conotrachelus sp. #28	-	1	-	-	-	-	-
Conotrachelus sp. #30	-	-	-	1	-	1	-
Conotrachelus sp. #31	-	-	-	-	4	-	-
Conotrachelus sp. #33	-	-	-	-	6	-	1
Conotrachelus sp. #34	-	-	-	-	6	-	-
Conotrachelus sp. #37	-	-	-	-	23	1	-
Conotrachelus sp. #38	-	-	-	-	1	-	-
Conotrachelus sp. #39	-	-	-	-	1	-	-
Conotrachelus sp. #41	-	-	-	-	1	2	-
Conotrachelus sp. #42	-	-	-	-	15	4	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Conotrachelus sp. #43	-	-	-	-	1	-	-
Conotrachelus sp. #44	15	-	-	-	-	-	-
Conotrachelus sp. #46	6	-	-	-	-	-	-
Conotrachelus sp. #47	23	-	-	-	-	-	-
Conotrachelus sp. #48	9	-	-	-	-	-	-
Conotrachelus sp. #49	37	-	-	-	-	-	-
Conotrachelus sp. #50	9	-	-	-	-	-	-
Conotrachelus sp. #51	19	-	-	-	-	1	-
Conotrachelus sp. #52	34	-	-	-	-	-	-
Conotrachelus sp. #53	37	-	-	-	-	-	-
Conotrachelus sp. #53a	78	-	-	-	-	-	-
Conotrachelus sp. #54	58	-	-	-	-	-	-
Conotrachelus sp. #56	14	-	-	-	-	-	-
Conotrachelus sp. #57	41	-	-	-	-	-	-
Conotrachelus sp. #58	151	-	-	-	-	-	-
Conotrachelus sp. #59	6	-	-	-	-	-	-
Conotrachelus sp. #60	27	-	-	-	-	-	-
Conotrachelus sp. #61	12	-	-	-	-	-	-
Conotrachelus sp. #62	1	-	-	-	-	-	-
Conotrachelus sp. #63	3	-	-	-	-	-	-
Conotrachelus sp. #65	16	1	-	-	-	-	-
Conotrachelus sp. #67	36	-	-	1	-	-	-
Conotrachelus sp. #69	16	-	-	-	-	-	-
Conotrachelus sp. #71	10	-	-	-	-	4	-
Conotrachelus sp. #72	14	-	-	-	-	-	-
Conotrachelus sp. #73	1	-	-	-	-	-	-
Conotrachelus sp. #75	2	-	-	-	-	-	-
Conotrachelus sp. #77	67	-	-	-	-	28	-
Conotrachelus sp. #79	83	-	-	-	-	-	-
Conotrachelus sp. #81	8	-	-	-	1	-	-
Conotrachelus sp. #82	-	-	-	-	10	-	-
Conotrachelus sp. #83	-	-	-	-	10	-	-
Conotrachelus sp. #85	-	-	-	-	38	-	-
Conotrachelus sp. #87	1	-	-	-	-	1	-
Conotrachelus sp. #88	-	-	-	-	-	1	-
Conotrachelus sp. #90	-	-	-	-	-	21	-
Conotrachelus sp. #91	-	-	-	-	-	3	-
Conotrachelus sp. #92	-	-	-	-	1	2	-
Conotrachelus sp. #93	-	-	-	-	-	1	-
Conotrachelus sp. #94	-	-	-	-	-	2	-
Conotrachelus sp. #96	-	-	-	-	-	1	-
Conotrachelus sp. #97	-	-	-	-	-	1	-
Conotrachelus sp. #98	-	-	-	-	-	14	-
Conotrachelus sp. #99	-	-	-	-	-	2	-
Conotrachelus sp. #100	-	-	-	-	-	1	-
Conotrachelus sp. #101	-	-	-	-	-	1	-
Conotrachelus sp. #102	-	-	-	-	-	1	-
Conotrachelus sp. #103	-	-	-	-	-	1	-
Conotrachelus sp. #104	-	-	-	-	-	3	-
Conotrachelus sp. #105	-	-	-	-	-	1	2
Conotrachelus sp. #106	-	-	-	-	-	1	-
Conotrachelus sp. #107	-	-	-	-	-	14	-
Conotrachelus sp. #108	-	-	-	-	-	2	-
Conotrachelus sp. #109	-	-	-	-	-	1	-
Conotrachelus sp. #110	-	-	-	-	-	2	-
Conotrachelus sp. #111	-	-	-	-	-	1	-
Conotrachelus sp. #112	1	-	-	-	-	14	-
Conotrachelus sp. #113	-	-	-	-	1	4	-
Conotrachelus sp. #114	-	-	-	-	-	1	-
Conotrachelus sp. #115	-	-	-	-	-	7	-
Conotrachelus sp. #116	-	-	-	-	-	2	-
Conotrachelus sp. #117	-	-	-	-	-	29	-
Conotrachelus sp. #118	-	-	-	-	-	2	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Conotrachelus sp. #119	-	-	-	-	-	3	-
Conotrachelus sp. #120	-	-	-	4	2	3	-
Conotrachelus sp. #121	-	-	-	-	-	6	-
Conotrachelus sp. #122	-	-	-	-	-	3	-
Conotrachelus sp. #123	-	-	-	-	-	1	-
Conotrachelus sp. #124	-	-	-	-	-	1	-
Conotrachelus sp. #125	1	-	-	-	-	1	-
Conotrachelus sp. #126	-	-	-	-	-	1	-
Conotrachelus sp. #128	-	-	-	-	-	1	-
Conotrachelus sp. #129	-	-	-	-	-	1	-
Conotrachelus sp. #131	-	-	-	-	-	9	-
Conotrachelus sp. #134	-	-	-	-	-	5	-
Conotrachelus sp. #135	-	-	-	-	-	1	-
Conotrachelus sp. #136	-	-	-	-	-	1	-
Conotrachelus sp. #137	-	-	-	-	-	3	-
Conotrachelus sp. #138	-	-	-	-	-	1	-
Conotrachelus sp. #139	-	-	-	-	-	1	-
Conotrachelus sp. #142	-	-	-	-	-	6	-
Conotrachelus sp. #144	-	-	-	-	-	1	-
Conotrachelus sp. #147	-	-	-	-	-	1	-
Conotrachelus sp. #150	-	-	-	-	-	7	-
Conotrachelus sp. #151	-	-	-	-	2	1	-
Conotrachelus sp. #153	-	-	-	-	-	1	-
Conotrachelus sp. #155	-	-	-	-	-	8	-
Conotrachelus sp. #157	-	-	-	-	-	1	-
Conotrachelus sp. #159	-	-	-	-	-	3	-
Conotrachelus sp. #160	-	-	-	-	-	2	-
Conotrachelus sp. #161	-	-	-	-	10	-	-
Conotrachelus sp. #162	-	-	-	-	2	-	-
Conotrachelus sp. #163	-	-	-	-	8	-	-
Conotrachelus sp. #164	-	-	-	-	8	-	-
Conotrachelus sp. #165	-	-	-	-	6	-	-
Conotrachelus sp. #168	-	-	-	-	1	-	-
Conotrachelus sp. #169	-	-	-	-	1	-	-
Conotrachelus sp. #171	-	-	1	-	1	10	-
Conotrachelus sp. #172	1	-	-	-	2	-	-
Conotrachelus sp. #173	-	-	-	-	2	-	-
Conotrachelus sp. #174	39	-	-	-	-	15	-
Conotrachelus sp. #175	-	-	-	-	-	5	-
Conotrachelus sp. #176	-	-	-	-	-	22	-
Conotrachelus sp. #177	16	-	-	-	-	-	-
Conotrachelus sp. #179	33	-	-	-	-	-	-
Conotrachelus sp. #180	13	-	-	-	-	-	-
Conotrachelus sp. #181	1	-	-	-	-	-	-
Conotrachelus sp. #182	3	-	-	-	-	-	-
Conotrachelus sp. #183	12	-	-	-	-	-	-
Conotrachelus sp. #184	1	-	-	-	-	-	-
Conotrachelus sp. #185	2	-	-	-	-	-	-
Conotrachelus sp. #186	2	-	-	-	-	-	-
Conotrachelus sp. #187	1	-	-	-	-	-	-
Conotrachelus sp. #188	1	-	-	-	-	-	-
Conotrachelus sp. #189	1	-	-	-	-	-	-
Conotrachelus sp. #190	6	-	-	-	-	-	-
Conotrachelus sp. #191	1	-	-	-	-	-	-
Conotrachelus sp. #192	1	-	-	-	-	-	-
Conotrachelus sp. #193	1	-	-	-	-	-	-
Conotrachelus sp. #194	2	-	-	-	-	-	-
Conotrachelus sp. #196	1	-	-	-	-	-	-
Conotrachelus sp. #197	1	-	-	-	-	-	-
Conotrachelus sp. #198	1	-	-	-	-	-	-
Conotrachelus sp. #199	16	-	-	-	-	-	-
Conotrachelus sp. #200	3	-	-	-	-	-	-
Conotrachelus sp. #201	3	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Conotrachelus sp. #202	8	-	-	2	-	-	-
Conotrachelus sp. #203	4	-	-	-	-	-	-
Conotrachelus sp. #204	2	-	-	-	-	-	-
Conotrachelus sp. #205	4	-	-	-	-	-	-
Conotrachelus sp. #206	3	-	-	-	-	-	-
Conotrachelus sp. #207	1	-	-	-	-	-	-
Conotrachelus sp. #208	9	-	-	-	-	-	-
Conotrachelus sp. #209	3	-	-	-	-	-	-
Conotrachelus sp. #210	1	-	-	-	-	-	-
Conotrachelus sp. #211	1	-	-	-	-	-	-
Conotrachelus sp. #212	1	-	-	-	-	-	-
Conotrachelus sp. #213	1	-	-	-	-	-	-
Conotrachelus sp. #214	6	-	-	-	-	-	-
Conotrachelus sp. #215	2	-	-	-	-	-	-
Conotrachelus sp. #216	1	-	-	-	-	-	-
Conotrachelus sp. #217	1	-	-	-	-	-	-
Conotrachelus sp. #218	1	-	-	-	-	-	-
Conotrachelus sp. #219	3	-	-	-	-	-	-
Conotrachelus sp. #220	8	-	-	-	-	-	-
Conotrachelus sp. #221	-	-	1	-	-	-	-
Conotrachelus sp. #222	-	-	-	-	-	1	-
Conotrachelus sp. #223	-	-	-	-	1	1	-
Conotrachelus sp. #224	-	-	-	-	1	-	-
Conotrachelus sp. #225	-	-	1	-	-	-	-
Conotrachelus sp. #226	-	-	1	-	-	-	-
Conotrachelus sp. #228	-	-	1	-	-	-	-
Conotrachelus sp. #229	-	-	-	1	-	-	-
Conotrachelus sp. #230	-	-	-	-	-	2	-
Conotrachelus sp. #231	-	-	-	-	-	1	-
Conotrachelus sp. #232	-	-	-	-	-	1	-
Conotrachelus sp. #233	-	-	-	-	-	1	-
Conotrachelus sp. #235	-	-	-	-	-	1	-
Conotrachelus sp. #236	-	-	-	-	-	1	-
Conotrachelus sp. #237	-	-	-	-	-	1	-
Conotrachelus sp. #238	-	-	-	-	-	1	-
Conotrachelus sp. #239	-	-	-	-	-	2	-
Conotrachelus sp. #240	-	-	-	1	-	-	-
Conotrachelus sp. #241	-	-	-	1	-	-	-
Conotrachelus sp. #242	-	-	-	-	-	2	-
Conotrachelus sp. #243	-	-	-	-	-	1	-
Conotrachelus sp. #244	-	-	-	-	-	1	-
Conotrachelus sp. #245	-	-	-	-	-	1	-
Conotrachelus sp. #246	-	-	-	-	-	1	-
Conotrachelus sp. #247	-	-	-	-	-	1	-
Conotrachelus sp. #248	-	-	-	-	-	1	-
Conotrachelus sp. #249	-	-	-	-	-	2	-
Conotrachelus sp. #250	-	-	-	-	-	1	-
Conotrachelus sp. #251	-	-	-	-	-	-	31
Conotrachelus sp. #253	-	-	-	-	-	-	1
Conotrachelus sp. #254	-	-	-	-	-	-	5
Conotrachelus sp. #255	-	-	-	-	-	-	9
Conotrachelus sp. #256	-	-	-	-	-	-	4
Conotrachelus sp. #257	-	-	-	-	-	-	2
Conotrachelus sp. #258	-	-	-	-	-	-	3
Conotrachelus sp. nr. anaglypticus (Say)	4	4	-	-	-	-	-
Conotrachelus sp. nr. corallifer Boheman	-	-	-	-	-	3	19
Conotrachelus sp. nr. uniformis Champion	4	-	-	-	-	-	-
Conotrachelus spinifer Champion	-	-	-	-	1	7	-
Conotrachelus squamulatus Champion	36	-	-	-	-	-	-
Conotrachelus striatirostris Champion	-	-	-	-	-	7	-
Conotrachelus subfasciatus Boheman	-	-	1	-	-	-	-
Conotrachelus subulatus Champion	2	-	-	2	-	-	-
Conotrachelus suturalis Champion	14	22	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Conotrachelus tegulatus Fiedler	-	1	-	-	-	-	-
Conotrachelus tetrastigma Champion	54	1	3	-	12	4	-
Conotrachelus triannulatus Champion	-	-	-	-	26	-	-
Conotrachelus tridens Champion	75	-	-	-	-	-	-
Conotrachelus turbatus Faust	57	68	10	-	-	-	-
Conotrachelus unidentatus Champion	7	-	-	-	1	-	-
Conotrachelus venustus Champion	2	20	-	-	-	-	-
Conotrachelus verticalis (Klug)	153	130	-	1	-	-	-
Conotrachelus vittaticollis Champion	-	-	-	-	1	9	-
Heilipodus atrosignatus (Champion)	51	-	-	-	-	3	-
Heilipodus biplagiatus (Boheman)	-	-	-	-	2	-	-
Heilipodus choicus (Germar)	42	-	-	-	-	-	-
Heilipodus cinctipennis (Champion)	1	-	-	-	-	-	-
Heilipodus cynicus (Pascoe)	-	-	-	-	-	1	-
Heilipodus dorbignyi (Guerin)	-	-	-	-	4	37	-
Heilipodus jocosus (Boheman)	21	-	-	-	-	-	-
Heilipodus lutosus (Pascoe)	199	-	-	-	4	-	-
Heilipodus naevulus (Mannerheim)	3	3	-	-	-	-	-
Heilipodus nigromaculatus (Champion)	-	-	-	-	-	2	-
Heilipodus phrynodes (Pascoe)	57	-	-	2	23	-	-
Heilipodus sp. nr. appendiculatus (Champion)	-	-	-	-	-	-	3
Heilipodus spinipennis (Champion)	-	-	-	-	-	22	-
Heilipodus suspensus (Pascoe)	1	-	-	-	-	-	-
Heilipodus trinotatus (Champion)	-	-	-	-	3	-	-
Heilipodus unifasciatus (Champion)	152	7	5	-	-	-	-
Heilipus areolatus (Champion)	-	-	-	-	3	2	3
Heilipus clathratus (Champion)	-	-	-	-	3	1	-
Heilipus draco (Fabricius)	18	-	-	-	-	-	-
Heilipus elegans Guerin	-	-	-	-	1	-	-
Heilipus ornatus (Champion)	11	-	-	-	-	-	-
Heilipus sp. #1	106	19	-	-	-	-	-
Heilipus sp. #2	-	2	-	-	-	-	-
Heilipus sp. #3	-	7	-	1	-	-	-
Heilipus sp. #5	1	5	-	-	3	-	-
Heilipus sp. #6	54	-	-	-	-	-	-
Heilipus sp. #7	79	-	-	-	-	-	-
Heilipus sp. #8	2	-	-	-	1	1	-
Heilipus sp. #9	23	-	-	-	-	-	-
Heilipus sp. #10	9	-	-	-	-	-	-
Heilipus sp. #11	12	-	1	-	-	-	-
Heilipus sp. #12	12	-	-	-	-	-	-
Heilipus sp. #13	41	-	-	-	-	-	-
Heilipus sp. #15	3	-	-	-	4	-	-
Heilipus sp. #16	-	1	-	-	-	-	-
Heilipus sp. #18	-	-	-	-	1	-	-
Heilipus sp. #20	-	-	-	-	-	3	-
Heilipus sp. #21	-	-	-	-	-	5	-
Heilipus sp. #22	-	-	-	-	-	1	-
Heilipus sp. #23	-	-	-	-	-	2	-
Heilipus sp. #24	-	-	-	-	-	1	-
Heilipus sp. #26	1	-	-	-	-	-	-
Heilipus sp. #27	5	-	-	-	-	-	-
Heilipus sp. #28	8	-	-	-	-	-	-
Heilipus sp. #29	1	-	-	-	-	1	-
Heilipus sp. #31	10	-	-	11	-	-	-
Heilipus sp. #32	1	-	-	-	-	-	-
Heilipus sp. #33	3	-	-	2	-	-	-
Heilipus sp. #34	2	-	-	-	-	-	-
Heilipus sp. #35	3	-	-	-	-	-	-
Heilipus sp. #36	1	-	-	-	-	-	-
Heilipus sp. #37	5	-	-	-	-	-	-
Heilipus sp. #38	10	-	-	-	-	-	-
Heilipus sp. #39	1	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Heilipus sp. #41	1	-	-	-	-	-	-
Heilipus sp. #42	-	-	1	-	-	-	-
Heilipus sulcifer Champion	-	-	1	-	-	-	-
Heilipus trifasciatus (Fabr.)	-	1	-	-	-	-	-
Heilipus unifasciatus Champion	-	-	-	7	-	-	-
Heilus bioculatus (Boheman)	148	-	11	1	-	1	-
Heilus guttatus (Boheman)	-	-	2	-	-	-	-
Hilipinus latipennis Champion	49	1	-	-	-	-	-
Hilipinus sp. #1	28	-	-	-	-	4	-
Hilipinus sp. #2	2	-	-	-	-	-	-
Hilipinus sp. #3	16	-	-	-	-	-	-
Hilipinus sp. #4	2	-	-	-	-	-	-
Hilipinus sp. #6	-	-	-	-	-	15	-
Hilipinus sp. #7	-	-	-	-	-	2	-
Hilipinus sp. #8	-	-	-	-	-	3	-
Hilipinus sp. #9	-	-	-	-	-	14	-
Hilipinus sp. #10	4	-	-	-	-	-	-
Hilipinus sp. #11	4	-	-	-	-	-	-
Hilipinus sp. #12	-	-	-	1	-	-	-
Hilipinus sp. #13	68	-	-	-	-	-	-
Hilipinus sp. #14	33	-	-	-	-	-	-
Hilipinus sp. #15	-	-	-	-	1	-	-
Hilipinus sp. #16	-	-	1	-	-	-	-
Hilipinus sp. #17	-	-	-	-	-	-	1
Hilipinus sulcicrus (Champion)	3	2	-	-	-	-	-
Homalinotus dorsalis (Kirsch)	6	1	-	-	-	-	-
Hypnideus multimaculatus Rosado Neto	4	-	-	-	-	-	-
Ithaura humilis Kuschel	-	5	-	-	-	-	-
Ithaura nitida Pascoe	120	13	1	-	-	-	-
Ithaura sp. #1	38	4	-	1	-	1	-
Ithyporini sp. #2	2065	72	-	-	-	-	-
Marshallius chiriquensis (Champion)	-	-	-	-	-	3	-
Marshallius guttatus (Boheman)	72	8	2	1	-	-	-
Marshallius leucostictus (Champion)	-	-	-	-	2	2	-
Marshallius securifer (Champion)	-	-	-	-	-	12	-
Marshallius sp. #1	-	-	-	1	-	-	-
Marshallius sp. nr. securifer (Champion)	-	-	-	-	-	15	-
Micralcinus sp. #1	-	-	-	-	170	-	-
Microhyus erinaceus Champion	1	-	-	1	-	-	-
Microhyus hystrix Champion	2	-	-	5	-	6	1
Microhyus longisetis Champion	-	-	-	-	-	1	-
Microhyus pallidisetis Champion	-	-	-	-	-	3	-
Microhyus sp. #1	-	-	-	-	-	57	-
Microhyus sp. #2	-	-	-	-	-	4	-
Microhyus sp. #6	-	-	-	-	-	2	-
Microhyus sp. #7	1	-	-	-	-	-	-
Microhyus sp. #9	1	-	-	-	-	-	-
Microhyus sp. #10	2	-	-	3	-	-	-
Mitrephorus curvilineatus Hustache	12	2	-	-	-	-	-
Oncorhinus latipennis Champion	-	-	-	-	-	1	-
Oncorhinus scabricollis Gyllenhal	82	-	-	-	-	-	-
Ozoctenus sp. #1	2	-	-	-	-	-	-
Ozopherus muricatus Pascoe	2	-	-	-	-	-	-
Parabyzes angulosus (Champion)	36	2	-	-	-	-	-
Pheloconus flavicans (Fiedler)	-	-	-	-	-	15	-
Pheloconus rubicundulus (Boheman)	4	10	-	-	18	-	-
Pheloconus sp. #1	1	-	-	-	-	-	-
Pheloconus sp. #2	-	-	-	-	-	1	-
Pheloconus sp. #3	-	-	-	1	-	-	-
Pseudanchonus debilis (Champion)	-	-	-	1	3	58	-
Pseudanchonus larvatus Kuschel	-	-	-	-	43	53	-
Pseudanchonus occultus (Champion)	41	4	6	4	10	21	-
Pseudanchonus sp. #1	-	-	-	-	-	1	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Pseudanchonus sp. #2	-	-	-	1	-	-	-
Pseudanchonus tuberculifer (Champion)	-	-	-	-	-	3	-
Rhineilipus cuvieri (Boheman)	28	-	-	-	-	-	-
Rhineilipus intensus (Pascoe)	1	-	-	1	-	-	-
Rhineilipus penicillatus (Champion)	5	-	1	1	-	-	-
Rhineilipus sulcifer (Champion)	51	-	1	-	-	-	-
Rhyparonotus sp. #1	-	-	-	-	-	-	1
Rhyssomatus dilaticollis Champion	-	1	-	-	-	-	-
Rhyssomatus nigerrimus Fahraeus	-	11	-	-	-	-	-
Rhyssomatus nitidus Champion	3	1	-	-	1	-	-
Rhyssomatus sp. #1	1	1	-	-	-	-	-
Rhyssomatus sp. #2	-	4	-	-	-	-	-
Rhyssomatus sp. #3	-	6	-	-	-	-	-
Rhyssomatus sp. #4	6	-	-	-	-	-	-
Rhyssomatus sp. #5	4	-	-	-	-	-	-
Rhyssomatus sp. #6	1	2	-	-	-	-	-
Rhyssomatus sp. #7	-	-	-	-	1	-	-
Rhyssomatus sp. #8	2	-	-	-	-	-	-
Rhyssomatus sp. #9	10	-	-	-	-	-	-
Rhyssomatus sp. #10	1	-	-	-	-	-	-
Rhyssomatus sp. #11	3	-	-	-	-	-	-
Rhyssomatus sp. #12	2	-	-	-	-	-	-
Rhyssomatus sp. #13	3	-	-	-	-	-	-
Rhyssomatus sp. #14	-	-	-	-	1	-	-
Sternechus brevicollis Champion	14	12	-	-	-	-	-
Sternechus nitidus Champion	6	7	-	-	-	-	-
Sternechus sp. #3	3	1	-	-	-	-	-
Sternechus sp. #6	22	-	-	-	-	-	-
Sternechus sp. #8	27	-	-	-	-	-	-
Sternechus sp. #9	2	-	-	-	-	-	-
Sternechus sp. #10	3	-	-	-	-	-	-
Sternechus sp. #11	6	-	-	-	-	-	-
Sternechus subrufus Fiedler	10	5	-	-	-	-	-
Thrasyomus sp. #1	-	-	-	-	-	2	-
Thrasyomus sp. #2	-	-	-	-	-	1	-
Thrasyomus tumens Pascoe	6	-	-	-	-	4	-
Thrasyomus uniformis Champion	21	-	-	-	-	-	-
OTIDOCEPHALINAE							
Hammatostylus argala (Erichson)	1	-	-	-	-	-	-
Ludovix bifasciatus (Champion)	1	-	-	-	-	-	-
Myrmex crassirostris (Champion)	3	-	-	-	-	-	-
Myrmex grandis (Chevrolat)	1	-	-	-	-	-	-
Myrmex laevipennis var. (Champion)	-	-	-	1	-	-	-
Myrmex laevis (Champion)	2	-	-	-	-	-	-
Myrmex sp. #1	-	1	-	-	-	-	-
Myrmex sp. #2	2	-	-	-	-	-	-
Myrmex sp. #3	14	-	-	-	-	-	-
Myrmex sp. #4	1	-	-	-	-	1	-
Myrmex sp. #5	-	-	1	1	-	-	-
Myrmex sp. #6	-	-	-	1	-	-	-
Myrmex sp. #9	5	-	-	-	-	-	-
Pimelerodius sharpi (Sleeper)	12	-	-	-	-	-	-
Pimelerodius sp. #2	1	-	-	-	-	-	-
Prosicoderes bituberculatus (Champion)	11	1	-	-	-	-	-
Sicoderus antilope (Fabricius)	1	-	-	-	-	-	-
Sicoderus laevigatus (Champion)	1	-	-	-	-	-	-
Sicoderus sp. #2	1	-	-	1	-	-	-
Sicoderus sp. #4	1	-	-	-	-	-	-
PETALOCHILINAE							
Hormops sp. #1	-	23	-	-	-	-	-
Spermologus sp. #1	3	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
POLYDROSINAE							
Claeoteges obliterata Champion	-	-	-	-	7	2	-
Claeoteges sp. #1	-	-	-	-	2	-	-
Compsus nigropunctatus Champion	2	-	-	-	-	-	-
Compsus sp. #1	3	-	-	-	-	-	-
Eustylus sexguttatus Champion	-	1	-	-	-	-	-
Exophthalmus carneipes Champion	-	-	-	-	2	-	-
Exophthalmus jekelianus (White)	13	-	-	-	-	-	-
Exophthalmus sp. #1	1	-	-	-	-	-	-
Exophthalmus sp. #2	1	-	-	-	-	-	-
Exophthalmus sp. #3	-	-	-	-	-	10	-
Exophthalmus sp. #4	1	-	-	-	-	-	-
Exophthalmus sp. #5	1	-	-	-	-	-	-
Exophthalmus sp. #6	-	-	1	-	-	1	-
Exophthalmus sulcicrus Champion	-	-	-	-	-	1	-
Macrostylus serripes (Champion)	3	-	-	-	-	-	-
Macrostylus sp. #1	11	-	-	-	-	-	-
Macrostylus sp. #2	1	-	-	-	-	13	-
Macrostylus sp. #7	-	-	-	-	-	10	-
Pandeleteius hieroglyphicus Champion	1	-	-	-	-	-	-
Polydacrys depressifrons Boheman	32	85	13	-	1	-	-
Polydrosinae gen. #2; sp. #1	2	-	-	-	-	-	-
Polydrosinae gen. #2; sp. #2	4	-	-	-	-	-	-
Polydrosinae sp. #1	-	-	-	-	1	-	-
Polydrosinae sp. #2	1	-	-	-	-	1	-
Polydrosinae sp. #3	-	-	-	-	-	1	-
Polydrosinae sp. #4	-	-	-	-	-	1	-
Polydrosinae sp. #5	-	-	-	-	-	1	-
Polydrusus sp. #1	-	-	-	-	-	4	-
PRIONOMERINAE							
Camptocheirus ornatus Pascoe	1	-	-	-	-	-	-
Ectyrsus elongatus Champion	-	2	-	-	-	-	-
Odontopus sp. #2	-	-	-	-	-	2	-
Odontopus sp. #3	1	-	-	-	-	-	-
Odontopus sp. nr. femoralis (Champion)	1	-	-	-	-	-	-
Piazorhinus sp. #1	1	-	-	-	-	-	-
Piazorhinus sp. #2	2	-	-	-	-	-	-
Piazorhinus sp. #3	-	-	3	-	-	-	-
Piazorhinus sp. #4	6	-	-	-	-	-	-
Piazorhinus sp. #5	1	-	-	-	-	-	-
Piazorhinus sp. #6	-	-	1	-	-	-	-
Piazorhinus sp. #7	-	-	-	-	-	1	-
Themeropis binodosa Champion	-	-	-	-	1	-	-
Themeropis divergens Pascoe	-	-	-	-	1	-	-
RHYNCHAENINAE							
Pedetinus halticoides (Champion)	-	-	-	-	-	1	1
RHYNCHOPHORINAE							
Mesocordylus abditus Vaurie	-	-	-	-	20	-	-
Mesocordylus bracteolatus (Boheman)	56	-	6	-	-	-	-
Mesocordylus dispersus Champion	57	-	-	-	-	-	-
Mesocordylus pustulosus Champion	-	-	-	-	-	1	-
Mesocordylus secundus Vaurie	-	-	-	-	23	45	-
Mesocordylus sp. #1	-	-	-	-	-	15	-
Mesocordylus sp. #2	1	-	-	-	-	-	-
Mesocordylus spumosus Vaurie	2	-	-	3	-	47	-
Mesocordylus striatus (Boheman)	2	15	-	-	-	-	-
Mesocordylus subulatus (Germar)	88	21	-	-	1	-	-
Metamasius cincinnatus Champion	-	-	-	-	-	1	-
Metamasius dasyurus Champion	-	-	-	-	-	1	-
Metamasius hebetatus (Gyllenhal)	-	-	-	3	-	22	-
Metamasius hemipterus sericeus (Olivier)	12	-	-	5	-	4	-
Metamasius sp. #1	-	-	-	1	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Metamasius sp. #2	-	-	-	-	-	1	-
Orthognathus subparallelus (Chevrolat)	8	-	-	1	14	-	-
Rhinostomus barbirostris (Fabricius)	1148	20	2	8	-	-	-
Rhinostomus thompsoni Vaurie	4	-	-	3	-	4	-
Sitophilus oryzae (L.)	2	-	-	-	-	1	-
RHYTIRRHININAE							
Listronotus dietrichi (Stockton)	-	57	13	-	-	-	-
TYCHIINAE							
Lignyodes pallidus (Champion)	17	3	-	-	-	-	-
Lignyodes sp. #2	-	1	-	-	-	-	-
Lignyodes sp. #3	1	-	-	-	-	-	-
Lignyodes sp. #4	3	-	-	-	-	-	-
Lignyodes sp. #5	7	-	-	-	-	-	-
Plocetes avertifer Clark	-	-	-	-	-	-	6
Sibinia rotundata Champion	-	-	-	-	1	-	-
ZYGOPINAE							
Arachnomorpha circumlineata Champion	3	-	-	-	-	-	-
Archocopturus regalis (Boheman)	2	-	1	-	-	-	-
Copturomimus asperatus Champion	2	-	-	-	-	-	-
Copturomimus caeruleotinctus Champion	1	-	-	-	-	-	-
Copturomimus cinereus Heller	4	-	-	-	1	-	-
Copturomimus sp. #1	3	-	-	-	-	-	-
Copturomimus sp. #2	-	-	-	-	1	-	-
Copturomimus sp. #3	-	-	-	-	-	8	-
Copturomimus sp. #4	-	-	-	1	-	1	-
Copturomimus sp. #5	-	-	-	-	1	-	-
Copturomimus sp. #6	1	-	-	-	-	-	-
Copturomimus sp. #7	1	-	-	-	-	-	-
Copturomimus sp. #8	1	-	-	-	-	-	-
Copturomimus sp. #10	-	-	-	-	1	-	-
Copturomimus sp. #11	-	-	-	1	-	-	-
Copturomimus sp. #12	-	-	-	1	-	-	-
Copturomorpha albomaculata Champion	5	-	-	-	-	-	-
Copturomorpha funerea Champion	1	-	-	-	-	-	-
Copturomorpha leucosticta Champion	1	-	-	-	-	-	-
Copturomorpha sp. #1	32	-	-	-	-	-	-
Copturomorpha sp. #2	2	-	-	-	-	-	-
Copturomorpha sp. #3	1	-	-	-	-	-	-
Copturomorpha sp. #4	2	-	-	-	-	-	-
Copturomorpha sp. #5	2	-	-	-	-	-	-
Copturomorpha sp. #6	-	-	-	-	13	1	-
Copturomorpha sp. #7	-	-	-	-	2	-	-
Copturomorpha sp. #8	-	-	-	-	1	-	-
Copturomorpha sp. #9	4	-	-	-	-	-	-
Copturomorpha sp. #10	1	-	-	-	-	-	-
Copturomorpha sp. #11	2	-	-	-	-	-	-
Copturomorpha sp. #12	1	-	-	-	-	-	-
Copturomorpha sp. #13	-	-	-	1	-	-	-
Copturomorpha sp. #15	1	-	-	-	-	-	-
Copturomorpha sp. #16	1	-	-	-	-	-	-
Copturomorpha sp. #17	2	-	-	-	-	-	-
Copturomorpha sp. #18	-	-	-	3	-	-	-
Copturomorpha sp. #19	-	-	-	-	-	1	-
Copturomorpha sp. #20	-	-	-	-	-	1	-
Copturus colymbus Heller	1	-	-	-	-	-	-
Copturus fulvomaculatus Champion	1	-	-	-	-	-	-
Copturus lamprothorax Heller	-	-	-	-	42	-	-
Copturus lynceus Champion	2	-	-	1	-	-	-
Copturus sp. #1	-	1	-	-	-	-	-
Copturus sp. #2	1	-	-	1	-	3	-
Copturus sp. #3	-	-	-	-	-	2	-
Copturus sp. #4	3	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Copturus sp. #5	1	-	-	-	-	-	-
Copturus sp. #7	-	-	-	1	-	-	-
Copturus sp. #8	1	-	-	-	-	-	-
Copturus sp. #10	1	-	-	-	-	-	-
Copturus sp. #11	1	-	-	-	-	-	-
Copturus sp. #12	3	-	-	-	3	-	-
Copturus sp. #13	1	-	-	-	-	-	-
Copturus sp. #15	-	-	1	-	-	-	-
Copturus sp. #16	-	-	1	-	-	-	-
Copturus sp. #17	-	-	-	1	-	-	-
Copturus sp. #18	-	-	-	1	-	-	-
Copturus sp. #19	-	-	-	1	-	-	-
Copturus sp. #20	-	-	-	-	-	2	-
Cratosomus aspersus Champion	3	-	-	-	-	-	-
Cratosomus curassavicus (Voet)	7	1	-	-	-	-	-
Cratosomus lentiginosus (Germar)	-	-	-	-	1	-	-
Cratosomus sp. #1	12	-	-	-	-	-	-
Cratosomus sp. #3	2	-	-	-	-	-	-
Cratosomus sp. #4	4	-	-	-	-	-	-
Eulechriops corusca Champion	3	-	-	-	-	-	-
Eulechriops ductilis Champion	5	-	-	-	-	-	-
Eulechriops sp. #6	-	-	-	-	-	27	-
Eulechriops sp. #7	-	-	-	-	-	1	-
Eulechriops sp. #8	-	-	-	-	-	2	-
Eulechriops sp. #9	-	-	-	-	-	1	-
Eulechriops sp. #10	-	-	-	-	-	2	-
Eulechriops sp. #11	-	-	-	-	1	-	-
Eulechriops sp. #12	-	-	-	-	1	-	-
Eulechriops sp. #13	-	-	-	-	1	-	-
Eulechriops sp. #14	8	-	-	-	-	-	-
Eulechriops sp. #15	5	-	-	-	-	-	-
Eulechriops sp. #16	1	-	-	-	-	-	-
Eulechriops sp. #17	8	-	-	-	-	-	-
Eulechriops sp. #18	1	-	-	-	-	-	-
Eulechriops sp. #19	13	-	-	-	-	-	-
Eulechriops sp. #20	1	-	-	-	-	-	-
Eulechriops sp. #21	1	-	-	-	-	-	-
Eulechriops sp. #22	10	-	-	-	-	-	-
Eulechriops sp. #23	1	-	-	1	-	-	-
Eulechriops sp. #24	18	-	-	-	-	-	-
Eulechriops sp. #25	1	-	-	-	-	-	-
Eulechriops sp. #26	2	-	-	-	-	-	-
Eulechriops sp. #27	2	-	-	-	-	-	-
Eulechriops sp. #28	2	-	-	-	-	-	-
Eulechriops sp. #32	-	-	-	1	-	-	-
Eulechriops sp. #33	6	-	-	-	-	-	-
Eulechriops sp. #34	1	-	-	-	-	-	-
Eulechriops sp. #35	2	-	-	-	-	-	-
Eulechriops sp. #36	2	-	-	-	-	-	-
Eulechriops sp. #37	1	-	-	-	-	-	-
Eulechriops sp. #38	4	-	-	-	-	-	-
Eulechriops sp. #39	2	-	-	-	-	-	-
Eulechriops sp. #40	3	-	-	-	-	-	-
Eulechriops sp. #41	1	-	-	-	-	-	-
Eulechriops sp. #42	2	-	-	-	-	-	-
Eulechriops sp. #43	2	-	-	-	-	-	-
Eulechriops sp. #44	2	-	-	-	-	-	-
Eulechriops sp. #45	1	-	-	-	-	-	-
Eulechriops sp. #46	1	-	-	-	-	-	-
Eulechriops sp. #47	3	-	-	-	-	-	-
Eulechriops sp. #48	1	-	-	-	-	-	-
Eulechriops sp. #49	2	-	-	-	-	-	-
Eulechriops sp. #50	1	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Eulechriops sp. #51	1	-	-	-	-	-	-
Eulechriops sp. #52	1	-	-	-	-	-	-
Eulechriops sp. #53	1	-	-	-	-	-	-
Eulechriops sp. #54	1	-	-	-	-	-	-
Eulechriops sp. #55	1	-	-	-	-	-	-
Eulechriops sp. #56	-	-	-	-	1	-	-
Eulechriops sp. #57	-	-	-	-	1	-	-
Eulechriops sp. #58	-	-	-	-	1	-	-
Eulechriops sp. #59	-	-	-	1	-	-	-
Eulechriops sp. #60	-	-	-	1	-	-	-
Eulechriops sp. #61	-	-	-	1	2	-	-
Eulechriops sp. #62	-	-	-	-	-	1	-
Eulechriops sp. #63	-	-	-	-	-	1	-
Eulechriops sp. #64	-	-	-	-	-	1	-
Eulechriops sp. #65	-	-	-	-	-	2	-
Eulechriops sp. #66	-	-	-	-	-	1	-
Eulechriops sp. #68	-	-	-	-	-	-	2
Eulechriops sp. #69	-	-	-	-	-	-	1
Eulechriops sp. #70	-	-	-	-	-	-	1
Eulechriops sp. #71	-	-	-	-	-	-	1
Eulechriops sp. #76	-	-	-	-	-	1	-
Eulechriops sp. #77	-	-	-	-	-	1	-
Eulechriops sp. #78	-	-	-	-	-	1	-
Eulechriops tenuirostris Champion	-	-	-	1	-	-	-
Hoplocopturus scintillans Champion	-	-	-	3	-	-	-
Isotrachelus sp. #1	4	-	-	-	-	-	-
Isotrachelus sp. #2	179	-	-	-	-	-	-
Isotrachelus sp. #3	215	-	-	-	-	-	-
Isotrachelus sp. #4	101	1	-	-	-	-	-
Isotrachelus sp. #5	34	-	-	-	-	-	-
Isotrachelus sp. #6	5	-	-	-	-	-	-
Isotrachelus sp. #7	13	-	-	-	-	-	-
Isotrachelus sp. #8	4	-	-	-	-	-	-
Isotrachelus tibialis (Champion)	519	7	-	-	-	-	-
Lechriops analis Champion	1	-	-	-	-	-	-
Lechriops bicolor Champion	-	-	-	-	-	3	-
Lechriops canescens Champion	2	-	-	-	-	-	-
Lechriops disparilis Champion	7	-	-	-	-	-	-
Lechriops maculiceps Champion	1	-	-	-	-	5	-
Lechriops parilis Champion	2	-	-	-	1	-	-
Lechriops parotica (Pascoe)	1	-	1	1	-	-	-
Lechriops rufomaculata Champion	-	-	-	2	-	-	-
Lechriops rugicollis Champion	5	-	-	-	-	-	-
Lechriops sp. #2	-	-	1	-	-	-	-
Lechriops sp. #3	-	1	-	-	-	-	-
Lechriops sp. #4	-	-	-	-	-	4	-
Lechriops sp. #5	-	-	-	-	-	2	-
Lechriops sp. #6	-	-	-	-	-	1	-
Lechriops sp. #7	-	-	-	1	-	2	-
Lechriops sp. #10	1	-	3	-	1	-	-
Lechriops sp. #11	1	-	-	-	-	-	-
Lechriops sp. #12	3	-	-	-	-	-	-
Lechriops sp. #13	1	-	-	-	-	-	-
Lechriops sp. #15	1	-	-	-	-	-	-
Lechriops sp. #16	1	-	-	-	-	-	-
Lechriops sp. #17	6	-	-	-	-	-	-
Lechriops sp. #18	75	-	-	-	-	-	-
Lechriops sp. #21	-	-	-	1	-	-	-
Lechriops sp. #22	-	-	-	7	-	-	-
Lechriops sp. #23	4	-	-	-	-	-	-
Lechriops sp. #24	2	-	-	-	-	-	-
Lechriops sp. #25	1	-	-	-	-	-	-
Lechriops sp. #26	1	-	-	-	-	-	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Lechriops sp. #27	1	-	-	-	-	-	-
Lechriops sp. #28	1	-	-	-	-	-	-
Lechriops sp. #30	1	-	-	-	-	-	-
Lechriops sp. #31	1	-	-	-	-	-	-
Lechriops sp. #32	2	-	-	-	-	-	-
Lechriops sp. #33	9	-	-	-	-	-	-
Lechriops sp. #34	1	-	-	-	-	-	-
Lechriops sp. #35	1	-	-	-	-	-	-
Lechriops sp. #36	1	-	-	-	-	-	-
Lechriops sp. #37	1	-	-	-	-	-	-
Lechriops sp. #38	2	-	-	-	-	-	-
Lechriops sp. #41	1	-	-	-	-	-	-
Lechriops sp. #42	5	-	-	-	-	-	-
Lechriops sp. #43	-	-	-	-	1	-	-
Lechriops sp. #44	-	-	1	-	-	-	-
Lechriops sp. #45	-	-	-	1	-	-	-
Lechriops sp. #46	-	-	-	2	-	2	-
Lechriops sp. #47	-	-	-	3	-	-	-
Lechriops sp. #48	-	-	-	-	-	1	-
Lechriops sp. #53	-	-	-	-	-	-	5
Lechriops sp. #54	-	-	-	-	-	-	6
Lechriops vestita (Boheman)	1	-	-	-	-	1	-
Lissoderes subnudus Champion	-	-	-	-	-	2	-
Macrolechriops sp. #1	7	-	-	-	-	-	-
Microzurus championi Hustache	-	-	-	-	1	-	-
Microzurus trinotatus Champion	4	-	-	-	-	-	-
Mnemynurus championi Heller	2	-	-	-	-	1	-
Mnemynurus poecilideres Champion	-	-	-	6	-	1	-
Philenis fuscofemorata Champion	2	-	-	1	-	-	-
Piazorhinus sp. #4	-	-	-	2	-	-	-
Piazurus alternans Kirsch	1	-	-	-	-	-	-
Piazurus helleri Champion	-	-	-	-	-	7	-
Piazurus maculipes Gyllenhal	38	-	-	4	-	-	-
Piazurus sp. #1	3	-	-	-	-	1	-
Piazurus sp. #2	-	-	-	1	-	-	-
Piazurus succivus Boheman	-	-	-	-	-	-	1
Piazurus sulphuriventris Heller	2	-	-	-	-	-	-
Pseudopiazurus centraliamericanus (Heller)	-	8	-	-	-	-	-
Pseudopinarus quadratus (Champion)	3	-	-	-	-	-	-
Pseudopinarus rana (Heller)	-	-	-	-	4	9	-
Psomus (genus near Ps.) sp. #1	6	-	-	-	-	-	-
Psomus sp. #1	90	-	-	-	-	-	-
Psomus sp. #2	2	-	-	-	-	-	-
Psomus sp. #3	3	-	-	-	-	-	-
Psomus sp. #4	3	-	-	-	-	-	-
Trichodocerus brevilineatus Champion	236	22	1	13	-	-	-
Trichodocerus brevilineatus var. Champion	41	-	-	1	-	-	-
Trichodocerus sp. #1	-	3	-	-	-	-	-
Trichodocerus sp. #3	-	-	-	2	-	-	-
Trichodocerus sp. #4	-	-	1	-	-	-	-
Trichodocerus spinolae Chevrolat	165	3	-	-	-	-	-
Zygopinae sp. #1	2	-	-	-	2	-	-
Zygopinae sp. #2	-	-	-	-	5	-	-
Zygopinae sp. #3	-	-	-	-	1	-	-
Zygopinae sp. #4	-	-	-	-	1	-	-
Zygopinae sp. #5	-	-	-	-	1	-	-
Zygopinae sp. #6	-	-	-	-	1	-	-
Zygopinae sp. #7	-	-	-	-	1	-	-
Zygopinae sp. #8	-	-	-	1	-	-	-
Zygopinae sp. #9	2	-	-	-	-	-	-
Zygopinae sp. #10	-	-	-	2	-	-	-
Zygopinae sp. #11	-	-	-	1	-	-	-
Zygopinae sp. #12	-	-	-	-	-	2	-

Taxon	BCI	LCC	MIR	CGR	BOQ	FOR	GUA
Zygops centromaculatus Desbrochers	1	-	-	-	-	-	-
Zygops maculipes Desbrochers	14	-	-	2	-	-	-
Zygops marmoreus Desbrochers	1	-	-	-	-	-	-
Zygops mexicanus Boheman	20	-	-	-	-	2	-
Zygops sp. #2	1	-	-	-	-	-	-
Zygops sp. #3	-	-	-	-	-	1	-
Zygops tridentatus Gyllenhal	5	-	-	3	-	-	-
Zygops tripartitus Desbrochers	1	-	-	-	-	-	-
Subtotal Individuals	95333	4011	3992	2229	2256	5500	391
Subtotal Species	1239	357	170	259	267	436	51
Total Individuals	113712						
Total Species	2030						

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