

INVITED PAPER

MINIREVIEW

Fifty Years of Entomological Publications in the Revista de Biología Tropical

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Abstract: Over its fifty year history nearly twenty percent of the papers published in the Revista de Biología Tropical have been about insects and arachnids. In the 1950's papers on arthropods of medical importance were dominant, in the 1960's there was a proliferation of papers on bees, and in more recent years the subjects have become increasingly diverse. In terms of nationality of contributing authors, the journal appears to have become increasingly international in later years.

Key words: Entomology, Costa Rica, Latin America, insects, arachnids.

The Revista de Biología Tropical has published papers on a wide diversity of tropical organisms, among which are insects and arachnids. Of the approximately 2300 papers published over the last fifty years, about 400, or 17.4%, deal with insects and arachnids (91.5% of these 400 papers are on insects and 8.5% on arachnids). Although there have been fluctuations – only 10% in the 1950's versus 27% in the 1970's – this figure has remained relatively constant throughout the fifty years.

In the early years of the journal the majority of entomological publications dealt with arthropods of medical and veterinary importance (Table 1). During the 1950's ten of the 13 entomological papers were authored or coauthored by Rodrigo Zeledón, who at the time was working in the Hospital de San Juan de Dios as an assistant of Alfonso Trejos, the founding father of the Revista (R. Zeledón, pers. comm.). Many of these papers dealt with the triatomine (Reduviidae) vectors of Chagas' disease, a trend which continued in the 1960's (nine papers on triatomines were published from 1963 to 1967). In later years the journal continued to publish

papers on medically important arthropods: the venomous *Phoneutria* (Ctenidae) and black widow spiders (Theridiidae: *Latrodectus*), ticks and mites, the sand fly vectors (Psychodidae) of leishmaniasis, and the mosquito vectors (Culicidae: *Anopheles*) of malaria. From 1973 to 1997 Mario Vargas authored or coauthored ten papers on Simuliidae, an important group of biting flies. Several of the papers published in the Revista describe parasites and parasitoids of medically important arthropods (Table 1; Table 3, Scelionidae), which could provide a means of lowering the populations of these arthropods. There have also been several papers on the ectoparasitic arthropods of wild birds and mammals (Vives and Zeledón 1957, Zeledón *et al.* 1957, Tonn and Arnold 1963, 1965, Arnold 1968, Camerik *et al.* 1974, Fain *et al.* 1981, Marinkelle and Grose 1981), the vectors of trypanosomes in frogs (Ramos and Urdaneta-Morales 1977), and *Varroa* mites in honey bees (Ramírez and Navarro 1993).

In the 1960's another trend emerges – a proliferation of papers on bees (Table 2). These publications began with Alvaro Wille, who

TABLE 1

Representative papers on Medical and Veterinary Entomology published in the Revista de Biología Tropical during the first 50 years of the journal

| | |
|------------------------|--|
| Venemous spiders | Trejos <i>et al.</i> 1971, González <i>et al.</i> 1998 |
| Ticks and mites | Fain <i>et al.</i> 1981, Vargas 1984, Herrero 1988, Hermans <i>et al.</i> 1994, Calderón and Sanchez 1996, Meléndez <i>et al.</i> 1998, Alvarez <i>et al.</i> 2000 |
| Cockroaches | Chinchilla <i>et al.</i> 1994 |
| Lice | Tonn and Arnold 1965 |
| Triatomine bugs | Zeledón 1953, 1955, 1956a, 1965, Zeledón and Vargas 1955, Zeledón and Vieto, 1957b, Zeledón and Morua 1963, Cirano and Zeledón 1964, Marinkelle 1965, 1967, 1982, Zeledón and Blanco 1965, Trejos and Hernández 1966, Herrera <i>et al.</i> 1972, Zeledón and Ponce 1972, Jirón and Zeledón 1982 |
| Fleas | Barrera 1966 |
| Phlebotomine sandflies | Rosabal and Trejos 1964, 1965, 1966, Herrero <i>et al.</i> 1991, 1993, Sierra <i>et al.</i> 2000 |
| Mosquitos | Vargas 1956, 1961, 1962, Lichtwardt and Gómez 1993, Maciá <i>et al.</i> 1997, Micieli and García 1997, García and Micieli 2000 |
| Black flies | Zeledón and Vieto 1957a, Vargas and Travis 1973, Travis <i>et al.</i> 1974, 1979, Vargas <i>et al.</i> 1977, 1980, 1990, Travis and Vargas 1978, Fallas and Vargas 1981, Vargas and Ramirez 1988, Vargas and Vargas 1997 |
| Ceratopogonid flies | Vargas 1960 |
| Tabanid flies | Fairchild 1961, Hogue and Fairchild 1974 |
| Human bot fly | Zeledón 1956b, 1957b |

TABLE 2

Representative papers on bees published in the Revista de Biología Tropical during the first 50 years of the journal

| | |
|------------------------|--|
| Colletidae, Andrenidae | Gaglianone 2000, Genaro 2001. |
| Halictidae | Wille and Orozco 1969, Wille and Michener 1970, Michener 1977, Michener <i>et al.</i> 1979. |
| Megachilidae | Genaro 1997, 2001. |
| Xylocopinae | Michener and Eickwort 1966, Da Silva <i>et al.</i> 1999. |
| Anthophorines | Raw 1977, 1979, Wille 1985, Genaro 2001. |
| Bombini | Ospina <i>et al.</i> 1987, Silva-Matos and Garófalo 2000. |
| Euglossini | Moure 1963, 1964, 1967, Dressler 1967, 1978a-b, 1982a-c, Gonzalez and Gaiani 1989, Ospina-Torres 1998. |
| Meliponini | Wille 1960, 1961, 1962, 1963a, 1964, 1965a-b, 1966, 1967, 1968, 1976, 1977, 1979b, Sakagami and Camargo 1964, Wille and Chandler 1964, Camargo 1968, Wille and Orozco 1974, Roubik 1980, 1981, Vergara <i>et al.</i> 1986, Marques-Souza <i>et al.</i> 1996, Pedro and Camargo 1997. |

published nine papers on stingless bees (Meliponini) from 1960 to 1968, and later continued publishing on these bees and on bee morphology (1970, 1979a). Wille did his doctoral research with Charles Michener, the world authority on bees at the University of Kansas, and the Revista thus began attracting contributions by other eminent bee specialists, for example Padre Moure and João Camargo from Brazil. The Revista has also published several papers on pollination, including some of the first publications describing 'buzz pollination', whereby the

bee shakes pollen out of tubular anthers (Michener 1962, Wille 1963b). Other papers cover the pollination of pejobaye palm by *Derelomus palmanum* (Curculionidae) (Mora and Solís 1980), of chayote (Cucurbitaceae) by *Partamona cupira* and *Trigona corvina* (Wille *et al.* 1983), of coconut palm by *Trigona silvestriana* (Hedström 1986), of *Xanthosoma* (Araceae) by *Cyclocephala* (Scarabaeidae) (Valerio 1988), of guava (Myrtaceae) by various Apidae (Hedström 1988b), of passion-flower (Passifloraceae) by *Xylocopa* bees (Da Silva *et*

TABLE 3

Representative papers on specific taxa of arachnids and insects published in the Revista de Biología Tropical during the first 50 years of the journal

| | |
|---------------|--|
| Scorpiones | Lourenço and Mendez 1984, Lourenço 1993, 1996, Florez 1996, Montoya and Armas 2002, Armas <i>et al.</i> 2002 |
| Araneae | Theraphosidae (Valerio 1979, 1980, Herrero and O'Dell 1988), Pholcidae (Huber 1997), Theridiosomatidae (Eberhard 1989), Uloboridae (Lahmann and Eberhard 1979) |
| Collembola | Mari Mutt 1978 |
| Ephemeroptera | Bello and Cabrera, 2001 |
| Odonata | Esquivel 1993, Ramírez 1997, González and Novelo 1998, Ramírez <i>et al.</i> 2000, Hedström and Sahlén 2001 |
| Orthoptera | Malavasi <i>et al.</i> 1981a-b, Kohlmann 1996 |
| Dermoptera | Patel and Habib 1978, Briceño and Schuch 1988, Briceño 1997 |
| Blattaria | Crawford and Cloudsley-Thompson 1970 |
| Psocoptera | García Aldrete 1978, 1981, 1984, 1997, 1999 |
| Thysanoptera | Johansen and García Aldrete 1976, Mound <i>et al.</i> 1993, Retana and Mound 1994, Del-Claro and Mound 1996, Retana <i>et al.</i> 1997, Retana 1998a-b, Johansen 1998, Mound 2002 |
| Hemiptera | |
| 'Homoptera' | Auchenorrhyncha (Rojas <i>et al.</i> 2001), Delphacidae (Macaya-Lizano 1997), Fulgoridae (Hogue 1984, Hogue <i>et al.</i> 1989), Cercopidae (Thompson 1997), Cicadidae (Young 1976), Cicadellidae (Godoy and Nielson 1998, Hidalgo-Gato 1999, Nova Coelho 1999, Nova Coelho and Da-Silva 2002), Psylloidea (Blackmer and Hanson 1997, Briceño 1998), Aphidoidea (Peronti and Sousa-Silva 2002), Aleyrodidae (Vásquez <i>et al.</i> 1997) |
| Heteroptera | Reduviidae-Apiomerinae (Adis 1984), Pentatomidae (Howard 1987, Vivan <i>et al.</i> 2002), Tingidae (Fallas <i>et al.</i> 1993), Lygaeidae (Rodríguez 1998) |
| Coleoptera | |
| Dytiscidae | Young 1980 |
| Carabidae | Cicindelinae (Wille and Michener, 1962) |
| Hydraenidae | Delgado <i>et al.</i> 1997 |
| Scarabaeidae | Wille 1973, Wille <i>et al.</i> 1974, Valerio 1988, Hilje 1996, Kohlmann, 1997, 2000, Escobar and Chacón de Ulloa 2000 |
| Cleridae | Rifkind 1997 |
| Languriidae | Pakaluk 1988 |
| Cerambycidae | Gilmour 1960, 1962, Di Iorio 1993, 1994, 1996, 1997a-b, González and Di Iorio 1997 |
| Bruchidae | Santos <i>et al.</i> 1997 |
| Chrysomelidae | Habib and Vasconcellos-Neto 1979, Savini 1994, Silveira and Dos Anjos 2001, Silveira <i>et al.</i> 2002 |
| Curculionidae | Parnell 1968, Mora and Solís 1980, Eberhard 1983, Diniz and Morais 1996, Anderson and Gómez 1997 |
| Scolytidae | Wood <i>et al.</i> 1991a-b, 1992, Jordal 1998, Morales <i>et al.</i> 2000 |
| Mecoptera | Byers 1977 |
| Trichoptera | Muñoz-Quesada 1999 |
| Lepidoptera | Morais <i>et al.</i> 1999, Pereira <i>et al.</i> 2001, Sittenfeld <i>et al.</i> 2002 |
| Moths | Glyptopterygidae (Calvo 1993), Limacodidae (Corrales and Epstein 1997, 2000), Tortricidae (Blanco <i>et al.</i> 2001), Crambidae (Phillips and Solis 1996), Lasiocampidae (Fischer and Patel 1993, 1994), Noctuidae (Rodríguez <i>et al.</i> 2001) |
| Butterflies | Young 1971, 1975, Young and Muyschondt 1972, Beutelspacher 1975, Calvo 1998, Monge-Nájera <i>et al.</i> 1998, Hughes <i>et al.</i> 1998, Zanetti <i>et al.</i> 1999, Swanson and Monge-Nájera 2000, Chacón and Nishida 2002 |
| Diptera | Asilidae (Scarborough 1993), Phoridae (Ramírez 1982, 1984, Wcislo, 1990, Brown 2000), Pipunculidae (Rafael and Menezes 1999), Tephritidae (Hedström 1988a, Mexzón 1997), Ropalomeridae (Soto-Manitui and Lezama 1988), Sepsidae (Briceño 2002, Eberhard 2002), Agromyzidae (Spencer 1983, Acosta and Cave 1994), Sarcophagidae (Downes 1994). |

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|------------------|--|
| Hymenoptera | |
| Cynipidae | Suárez and Blanco 1991 |
| Scelionidae | Zeledón 1957a, Valerio 1970, 1984, Rabinovich 1971, Torres <i>et al.</i> 1997, Venzon <i>et al.</i> 1999 |
| Agaonidae | Ramírez 1988, 1991, 1997, Ramírez and Montero 1988, Ramírez and Malavasi 1997 |
| Eulophidae | González <i>et al.</i> 1996, Hansson and Nishida 2002 |
| Encyrtidae | Torres <i>et al.</i> 1997, Venzon <i>et al.</i> 1999, Zanoncio <i>et al.</i> 2000. |
| Eurytomidae | Pereira <i>et al.</i> 1998 |
| Ichneumonidae | Gauld and Lafranco 1987 |
| Vespidae | Nelson 1970, Diniz and Kitayama 1998, Mechi 1999, Camillo 1999, 2001 |
| Leaf-cutter ants | Cordero 1963, Fowler 1977, 1983, Farji <i>et al.</i> 1992, Farji and Sierra 1993, Farji 1993, Gomides <i>et al.</i> 1997, Tonhasca and Lima Bragança 2000 |
| Ants/plants | Ibarra and Dirzo 1990, Pfannes and Baier 2002 |
| Other ants | Lattke 1986, 1990, Bustos and Ulloa-Chacón 1997, Fernández and Palacio 1997, Mackay 1998, Estrada and Fernández 1999, Pérez <i>et al.</i> 1999, McGlynn and Kirksey 2000, Sanjuán <i>et al.</i> 2001 |
| Sphecidae | Post 1981, Genaro 1993, 1995, 1999, Genaro and Alayon 1994, Grajales and Wcislo 1998, Camillo and Brescovit 1999, 2000, Buys 2001, Camillo 2002 |

al. 1999), and the insects associated with flowers of weedy plants (Fernández *et al.* 2001).

Although the Revista continued publishing papers on medical entomology and bees after the 1960's, the entomological subjects became increasingly diverse in later years. Indeed, it is impressive how almost every order of insects is included (Table 3). The only major groups of insects that are absent are stick insects (Phasmatodea), mantids (Mantodea), termites (Isoptera), and Neuroptera. In general there are numerous papers on groups of insects that are particularly common in the Neotropics, such as fig wasps (Agaonidae), leaf-cutter ants (Formicidae: Attini), orchid bees, and stingless bees. Most of the papers treat taxonomy, ecology, or behavior, although there are a few on morphology and physiology. There are other entomological papers that cannot be categorized taxonomically, for example papers on soil arthropods (Fraile and Serrafino 1978, Serafino and Fraile 1978, Lieberman and Dock 1982), aquatic insects (Jiménez and Springer 1994, 1996, Arocena 1996, López *et al.* 1997, Cressa 1999a-b), and herbivorous insects (Coley 1987, Dirzo 1987, Marquis 1987).

I have not reviewed citation indexes and thus cannot evaluate which entomological papers published in the Revista have been most frequently cited. I would, however, like to mention just a few papers that seem noteworthy (these of course reflect personal biases and sev-

eral have undoubtedly been overlooked). For example, the Revista published the first known case of an aquatic homopteran, a cercopid found in the bracts of *Heliconia* (Heliconiaceae) (Thompson 1997). There are very few protozoan parasites of plants and thus it is worth noting a couple of papers on a trypanosome that inhabits the latex of Asclepiadaceae and which is transmitted by *Oncopeltus* (Lygaeidae) (Ruíz 1958, Ayala *et al.* 1975). While there are numerous studies of the predators, parasitoids and pathogens associated with lepidopteran larvae, there are very few studies of their gut bacteria (Sittenfeld *et al.* 2002). The phorid flies that parasitize ants have received considerable attention, but there is relatively little information available on those that attack bees (Ramírez 1982, 1984, Wcislo 1990).

The Revista de Biología Tropical has published relatively few papers on crop pests, which is appropriate since there are other journals dedicated almost exclusively to this topic. However a few noteworthy papers relating to biological control of insects have been published in the Revista. José Rutilio Quesada, who did his doctorate research under Paul DeBach (one of the major figures in the field) at the University of California, was one of the first to do research in Latin America demonstrating that insecticides often devastate the populations of natural enemies of insect pests, thereby provoking a resurgence in the pest populations (Quezada *et al.*

TABLE 4
Entomological monographs published by the Revista de Biología Tropical

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| Coleoptera | |
| Chrysomelidae: Eumolpinae | Flowers 1996 |
| Chrysomelidae: Hispini: <i>Cephaloleia</i> | Staines 1996 |
| Diptera | |
| Psychodidae (excluding Phlebotominae) | Quate 1996 |
| Hymenoptera | |
| Ichneumonidae: Pimplinae | Gauld <i>et al.</i> 1998 |
| Sphecidae | Menke and Fernández 1996 |
| Apidae: Meliponini (nests) | Wille and Michener 1973 |

1973). It has occasionally been noted that the dust from roads can interfere with parasitoid activity, but Wille and Fuentes (1975) reported a unique resurgence of pests following the eruption of Volcan Irazú in Costa Rica. Naturally occurring parasitoids that help control pests have been reported from the leafminer, *Liriomyza* (Agromyzidae), which occurs in various crops (Acosta and Cave 1994), and from stink bugs (Pentatomidae) in soybean (Venzon 1999) and *Eucalyptus* plantations (Zanuncio *et al.* 2000). The sugarcane borer (Pyralidae: *Diatraea*) is normally controlled through mass-rearing and periodic liberation of tachinid and braconid parasitoids. The competition between these parasitoids was studied by Weir and Sagarzazu (1998).

I have not analyzed the geographic distribution of the research or the nationality of the authors contributing entomological papers to the Revista. However, it is obvious that the overwhelming majority of the papers are from research carried out in Latin America (which is appropriate), and a cursory inspection of the nationality of the authors suggests that the journal has become more international in the last 25 years. At least some of the foreign contributors were probably motivated to publish in the journal through their contacts with Costa Rican entomologists (this idea could be tested by examining the nationality of coauthored papers).

Special mention should be made of the the entomological monographs (four supplements and two special publications) published by the Revista (Table 4). These are primarily taxonom-

ic in nature (several were done in collaboration with the Instituto Nacional de Biodiversidad) and provide a valuable resource in a region where the mere identification of insects presents a major obstacle to entomological research. Indeed, given that the majority of neotropical insects are undescribed, numerous large volumes will be required to remedy this situation.

In Latin America relatively few countries (Mexico, Colombia, Venezuela, Peru, Brazil, Argentina, Chile) publish journals dedicated to entomology. Thus the Revista de Biología Tropical, along with other general biological journals published in the region, provides a valuable, bilingual site for publishing the results of entomological research and for consulting these results. May the next fifty years be as entomologically prosperous as the last fifty years.

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RESUMEN

A través de su historia de cincuenta años, casi veinte por ciento de los artículos publicados en la Revista de Biología Tropical trataron de insectos y arácnidos. En los años cincuenta dominaron los artículos sobre artrópodos de importancia médica, en los años sesenta hubo una proliferación de artículos sobre abejas, y en los últimos años los temas incluidos se hicieron más diversos. En términos de la nacionalidad

de los autores contribuyentes, parece que la revista se ha vuelto más internacional en los últimos años.

REFERENCES

- Acosta, N.M. & R.D. Cave. 1994. Inventario de los parasitoides de *Liriomyza* spp. (Diptera: Agromyzidae) en la región sur de Honduras. *Rev. Biol. Trop.* 42: 203-218.
- Adis, J. 1984. Eco-entomological observations from the Amazon. V. Feeding habits of Neotropical "bee killers" and "resin bugs" (Apiomerinae: Reduviidae: Hemiptera). *Rev. Biol. Trop.* 32: 151-153.
- Álvarez C., V., R. Bonilla M. & I. Chacón G. 2000. Distribución de la garrapata *Amblyomma cajennense* (Acarí: Ixodidae) sobre *Bos taurus* y *Bos indicus* en Costa Rica. *Rev. Biol. Trop.* 48: 129-135.
- Anderson, R.S. & L.D. Gómez-P. 1997. *Systemotelus*, a remarkable new genus of weevil (Coleoptera: Curculionidae) associated with *Carlhudovica* (Cyclanthaceae) in Costa Rica and Panamá. *Rev. Biol. Trop.* 45: 887-904.
- Armas, L.F. de, C. Viquez & M. Montoya. 2002. Complementos a la descripción de *Tityus dedoslargos* (Scorpiones: Buthidae). *Rev. Biol. Trop.* 50: 161-167.
- Arnold, K.A. 1968. Notes on avian ectoparasites from Costa Rica. I. Acarina and Diptera. *Rev. Biol. Trop.* 16: 259-266.
- Arocena, R. 1996. La comunidad bentónica como indicadora de zonas de degradación y recuperación en el arroyo Toledo (Uruguay). *Rev. Biol. Trop.* 44: 659-671.
- Ayala, S.C., O.B. de Quintero & P. Barreto. 1975. Tripanosomátidos de plantas laticíferas y sus insectos transmisores en Colombia y Costa Rica. *Rev. Biol. Trop.* 23: 5-16.
- Barrera, A. 1966. Nota preliminar sobre algunos Siphonaptera de Costa Rica. *Rev. Biol. Trop.* 14: 293-296.
- Bello C., C.L. & M.I. Cabrera F. 2001. Alimentación ninfal de Leptophlebiidae (Insecta: Ephemeroptera) en el Caño Paso del Diablo, Venezuela. *Rev. Biol. Trop.* 49: 999-1003.
- Beutelspacher B., C.R. 1975. Dos nuevas especies de la familia Riodinidae (Lepidoptera) de México. *Rev. Biol. Trop.* 23: 53-66.
- Blackmer, J.L. & P. Hanson. 1997. Abundance and life history of two gall-inducing homopterans on *Nectandra salicina* (Lauraceae) in Monteverde, Costa Rica. *Rev. Biol. Trop.* 45: 1131-1137.
- Blanco-Metzler, H., A.D. Watt & D. Cosens. 2001. Within-tree distribution of *Ecdytolopha torticornis* (Lepidoptera: Tortricidae) oviposition on macadamia nuts. *Rev. Biol. Trop.* 49: 697-702.
- Briceño L., R.D. 1998. Host plant use and possibly defensive horns in *Trichohermes magna* (Psyllidae: Homoptera). *Rev. Biol. Trop.* 46: 841-843.
- Briceño L., R.D. 2002. Water contact during courtship of males of *Archisepsis diversiformis* (Sepsidae). *Rev. Biol. Trop.* 50: 135-136.
- Briceño L., R.D. & W. Schuch. 1988. Reproductive biology and behavior *Doru taeniatum* (Forficulidae). *Rev. Biol. Trop.* 36: 437-440.
- Briceño L., R.D. 1997. Genitalic structure and copulation in *Paralabella dorsalis* (Dermaptera: Labbidae). *Rev. Biol. Trop.* 45: 1107-1116.
- Brown, B.V. 2000. The species of *Phora* (Diptera: Phoridae) of Costa Rica. *Rev. Biol. Trop.* 48: 977-982.
- Bustos, H., J. & P. Ulloa-Chacón. 1997. Mirmecofauna y perturbación en un bosque de niebla neotropical (Reserva Natural Hato Viejo, Valle del Cauca, Colombia). *Rev. Biol. Trop.* 44/45: 259-266.
- Buyts, S.C. 2001. Last instar larva of *Penepodium dubium* (Hymenoptera: Sphecidae). *Rev. Biol. Trop.* 49: 329-332.
- Byers, G.W. 1977. Revision of the genus *Pazius* (Mecoptera: Bittacidae). *Rev. Biol. Trop.* 25: 109-122.
- Calderón, O. & C. Sánchez. 1996. Variabilidad morfológica en tres cepas de *Sarcoptes scabiei* (Acaridida: Sarcoptidae) de Costa Rica. *Rev. Biol. Trop.* 44: 679-682.
- Calvo, R. 1993. Larvas de *Glyphipteryx* sp. (Lepidoptera: Glyphipterygidae), en agallas de *Hyptis urticoides*. *Rev. Biol. Trop.* 41: 887-888.
- Calvo, R. 1998. Reproducción de *Oenamauis ortignus* (Lepidoptera: Lycaenidae) en Barva, Heredia, Costa Rica. *Rev. Biol. Trop.* 46: 101-104.
- Camargo, J.M.F. De. 1968. Ninhos ebiologai de algumas espécies de Meliponideos (Hymenoptera: Apidae) da região de Pôrto Velho, Território de Rondônia, Brasil. *Rev. Biol. Trop.* 16: 207-240.

- Camerik, A.M., F.S. Lukoschus & E. Mendez. 1974. A new species of *Orycteroxenus* Zachvatkin from *Cryptotis n. nigrescens* (Acarina: Sarcoptiformes: Glycyphagidae). *Rev. Biol. Trop.* 22: 239-246.
- Camillo, E. & A.D. Brescovit. 1999. Spiders (Araneae) captured by *Trypoxylon (Trypargilum) lactitarse* (Hymenoptera: Sphecidae) in southeastern Brazil. *Rev. Biol. Trop.* 47: 151-162.
- Camillo, E. & A.D. Brescovit. 2000. Spider prey (Araneae) of *Trypoxylon (Trypargilum) rogenhoferi* (Hymenoptera: Sphecidae) in southeastern Brazil. *Rev. Biol. Trop.* 48: 647-655.
- Camillo, E. 1999. A solitary Brazilian mud-daubing wasp, *Brachymenes dyscherus* (Hymenoptera: Vespidae) with evidence of a life-cycle polyphenism. *Rev. Biol. Trop.* 47: 949-958.
- Camillo, E. 2001. Inquilines of *Brachymenes dyscherus* nests with special reference to *Monobia schrottkyi* (Hymenoptera, Vespidae, Sphecidae). *Rev. Biol. Trop.* 49: 1005-1112.
- Camillo, E. 2002. The natural history of the mud-dauber wasp *Sceliphron fistularium* (Hymenoptera: Sphecidae) in southeastern Brazil. *Rev. Biol. Trop.* 50: 127-134.
- Chacón, I. & K. Nishida. 2002. A new species of *Cyloopsis* (Lepidoptera: Nymphalidae: Satyrinae) from Costa Rica. *Rev. Biol. Trop.* 50: 679-683.
- Chaverri, E. 1954. Anotaciones sobre la biología del *Antianthe expansa* Germar, plaga del pimientero en Costa Rica. *Rev. Biol. Trop.* 2: 269-282.
- Chinchilla, M., O.M. Guerrero, A. Castro & J. Sabah. 1994. Cockroaches as transport hosts of the protozoan *Toxoplasma gondii*. *Rev. Biol. Trop.* 42: 329-331.
- Cirano, R. & R. Zeledón. 1964. Observaciones sobre capacidad alimenticia y respiración de *Triatoma infestans* y *Rhodnius prolixus* (Hemiptera, Reduviidae). *Rev. Biol. Trop.* 12: 271-285.
- Coley, P.D. 1987. Patrones en las defensas de las plantas: ¿porqué los herbívoros prefieren ciertas especies? *Rev. Biol. Trop.* 35 (Suppl. 1): 151-164.
- Cordero, A.D. 1963. An unusual behavior of the leafcutting ant queen *Acromyrmex octospinosus* (Reich). *Rev. Biol. Trop.* 11: 221-222.
- Corrales, J.F. & M.E. Epstein. 1997. Review of Costa Rican *Venadicodia*, with descriptions of two new species and localities for *V. ruthea* (Lepidoptera: Limacodidae). *Rev. Biol. Trop.* 45: 1093-1105.
- Corrales, J.F. & M.E. Epstein. 2000. New species in the New World *Natada* complex (Lepidoptera: Limacodidae). *Rev. Biol. Trop.* 48: 591-604.
- Crawford, C.S. & J.L. Cloudsley-Thompson. 1970. Concealment behavior of nymphs of *Blaberus giganteus* L. (Dictyoptera: Blattaria) in relation to their ecology. *Rev. Biol. Trop.* 18: 53-62.
- Cressa, C. 1999a. Dry mass estimates of some tropical aquatic insects. *Rev. Biol. Trop.* 47: 133-141.
- Cressa, C. 1999b. Dry mass estimation of tropical aquatic insects using different short-term preservation methods. *Rev. Biol. Trop.* 47: 143-149.
- Da Silva, M.M., C.H. Bruckner, M. Picanço & A.J. Molina-Rugama. 1999. Número floral, clima, densidad poblacional de *Xylocopa* spp. (Hymenoptera: Anthophoridae) y polinización del maracuyá (*Passiflora edulis f. flavicarpa*). *Rev. Biol. Trop.* 47: 711-718.
- Del-Claro, K. & L.A. Mound. 1996. Phenology and description of a new species of *Liothrips* (Thysanoptera: Phlaeothripidae) from *Didymopanax* (Araliaceae) in Brazilian cerrado. *Rev. Biol. Trop.* 44: 193-197.
- Delgado, J.A., F. Collantes & A.G. Soler. 1997. Distribución y ciclo vital de tres especies del género *Hydrae* en Nicaragua (Coleoptera: Hydraenidae). *Rev. Biol. Trop.* 44/45: 645-649.
- Di Iorio, O.R. 1993. Cerambycidae (Coleoptera) y otros organismos asociados con la floración de *Parkinsonia aculeata* (Leguminosae). *Rev. Biol. Trop.* 41: 463-470.
- Di Iorio, O.R. 1994. Cerambycidae y otros Coleoptera emergidos de ramas cortadas por *Oncideres germari* (Lamiinae: Onciderini) en el norte argentino. *Rev. Biol. Trop.* 42: 649-661.
- Di Iorio, O.R. 1996. Cerambycidae y otros Coleoptera de Leguminosae cortados por *Oncideres germari* (Lamiinae: Onciderini) en Argentina. *Rev. Biol. Trop.* 44: 551-565.
- Di Iorio, O.R. 1997a. Plantas hospedadoras y biogeografía de Cerambycidae (Coleoptera) del noroeste y centro de la Argentina. *Rev. Biol. Trop.* 44/45: 149-158.
- Di Iorio, O.R. 1997b. Plantas hospedadoras de Cerambycidae (Coleoptera) en el Espinal periéstepico y en la provincia de Buenos Aires, Argentina. *Rev. Biol. Trop.* 44/45: 159-165.

- Diniz, D.I. & K. Kitayama. 1998. Seasonality of vespid species (Hymenoptera: Vespidae) in a central Brazilian cerrado. *Rev. Biol. Trop.* 46: 109-114.
- Diniz, I.R. & H. C. Morais. 1996. Herbivory by the weevil *Phelypera schuppeli* (Curculionidae) feeding on the tree *Pachira aquatica* (Bombacaceae) and parasitoid attack. *Rev. Biol. Trop.* 44: 919-921.
- Dirzo, R. 1987. Estudios sobre interacciones planta-herbívoro en "Los Tuxtlas", Veracruz. *Rev. Biol. Trop.* 35 (Supplement 1): 119-131.
- Downes, W.L. 1994. Perching behavior and coloration in temperate and tropical Sarcophagidae (Diptera). *Rev. Biol. Trop.* 42: 195-201.
- Dressler, R.L. 1967. Observations on orchids and Euglossine bees in Panama and Costa Rica. *Rev. Biol. Trop.* 15: 143-184.
- Dressler, R.L. 1978a. New species of *Euglossa* from Mexico and Central America. *Rev. Biol. Trop.* 26: 167-185.
- Dressler, R.L. 1978b. An infrageneric classification of *Euglossa*, with notes on some features of special taxonomic importance (Hymenoptera: Apidae). *Rev. Biol. Trop.* 26: 187-198.
- Dressler, R.L. 1982a. New species of *Euglossa*. II. (Hymenoptera: Apidae). *Rev. Biol. Trop.* 30: 121-129.
- Dressler, R.L. 1982b. New species of *Euglossa*. III. The *bursigera* species group (Hymenoptera: Apidae). *Rev. Biol. Trop.* 30: 131-140.
- Dressler, R.L. 1982c. New species of *Euglossa*. IV. The *cordata* and *purpurea* species groups (Hymenoptera: Apidae). *Rev. Biol. Trop.* 30: 141-150.
- Eberhard, W.G. 1989. Niche expansion in the spider *Wendilgarda galapagensis* (Araneae, Theridiosomatidae) on Cocos Island. *Rev. Biol. Trop.* 37: 163-168.
- Eberhard, W.G. 1983. Behavior of adult bottle brush weevils (*Rhinostomus barbirostris*) (Coleoptera: Curculionidae). *Rev. Biol. Trop.* 31: 233-244.
- Eberhard, W.G. 2002. The function of female resistance behavior: Intromission by male coercion vs. female cooperation in sepsid flies (Diptera: Sepsidae). *Rev. Biol. Trop.* 50: 485-505.
- Escobar, S., F. & P. Chacón de Ulloa. 2000. Distribución espacial y temporal en un gradiente de sucesión de la fauna de coleópteros coprófagos (Scarabaeinae, Aphodiinae) en un bosque tropical montano, Nariño – Colombia. *Rev. Biol. Trop.* 48: 961-
- Esquivel, C. 1993. *Psaironeura selvatica* sp. nov. (Odonata: Protoneuridae), a new damselfly from Costa Rica. *Rev. Biol. Trop.* 41: 703-707.
- Estrada M., C. & F. Fernández C. 1999. Diversidad de hormigas (Hymenoptera: Formicidae) en un gradiente sucesional del bosque nublado (Nariño, Colombia). *Rev. Biol. Trop.* 47: 189-201.
- Fain, A., E. Mendez & F.S. Lukoschus. 1981. *Archemyobia* (*Nearchemyobia*) *latipilis* sp. n. (Acari: Prostigmata: Myobiidae) parasitic on marsupials in Panamá and Brazil. *Rev. Biol. Trop.* 29: 77-81.
- Fairchild, G.B. 1961. A preliminary check list of the Tabanidae (Diptera) of Costa Rica. *Rev. Biol. Trop.* 9: 23-39.
- Fallas, E.M., M.A. Arguedas & R.D. Briceño. 1993. Dispersión y métodos de crías de *Dictyla monotropidia* (Hemiptera: Tingidae). *Rev. Biol. Trop.* 41: 509-513.
- Fallas, F. & M. Vargas V. 1981. Bionomics of black flies (Diptera: Simuliidae) in Costa Rica. VIII. Observations on the natural infection of black fly larvae by *Neomesomermis travisi* (Nematoda: Mermithidae). *Rev. Biol. Trop.* 29: 308-310.
- Farji B., A.G., P. Folgarait & J. Protomastro. 1992. Asociación entre el arbusto *Capparis retusa* (Capparidaceae) y las hormigas *Camponotus blandus* y *Acromyrmex striatus* (Hymenoptera: Formicidae). *Rev. Biol. Trop.* 40: 341-344.
- Farji Brener, A.G. & C. Sierra. 1993. Distribution and attacked plants along trails in leaf-cutting ants (Hymenoptera: Formicidae): consequences in territorial strategies. *Rev. Biol. Trop.* 41: 891-896.
- Farji Brener, A.G. 1993. Influencia de la estacionalidad sobre los ritmos forrajeros de *Atta laevigata* (Hymenoptera: Formicidae) en una sabana tropical. *Rev. Biol. Trop.* 41: 897-899
- Fernández, C., F. & E.E. Palacio G. 1997. Clave para las *Pogonomyrmex* (Hymenoptera: Formicidae) del Norte de Suramérica, con la descripción de una nueva especie. *Rev. Biol. Trop.* 45: 1649-1661.
- Fernández, T., J.L., G. Garcés G., E. Portuondo F., P. Valdés T. & I. Expósito E. 2001. Insectos asociados con flores de malezas del Jardín Botánico de Santiago de Cuba, con énfasis en Hymenoptera. *Rev. Biol. Trop.* 49: 1013-1026.

- Fischer, H.Z. & P.N. Patel. 1993. Fluctuación poblacional y comportamiento de mariposas (Lepidoptera: Lasiocampidae) y de sus parasitoides (Hymenoptera y Diptera) en aguacate (*Persea americana*). Rev. Biol. Trop. 41: 515-519.
- Fischer, H.Z. & P.N. Patel. 1994. Ciclo vital y morfología larval de *Euglyphis rivulosa* (Lepidoptera: Lasiocampidae). Rev. Biol. Trop. 42: 219-223
- Florez D., E. 1996. *Tityus lourençoi*, a new species of scorpion from the Cordillera Oriental, Colombia (Scorpiones: Buthidae). Rev. Biol. Trop. 44: 683-685.
- Flowers, R.W. 1996. The subfamily Eumolpinae (Coleoptera: Chrysomelidae) in Central America. Rev. Biol. Trop., Special Publication No. 2: 1-59.
- Fowler, H.G. 1977. Some factors influencing colony spacing and survival in the grass-cutting ant *Acromyrmex landolti fracticornis* (Forel) (Formicidae: Attini) in Paraguay. Rev. Biol. Trop. 25: 89-100.
- Fowler, H.G. 1983. Latitudinal gradients and diversity of the leaf-cutting ants (*Atta* and *Acromyrmex*) (Hymenoptera: Formicidae). Rev. Biol. Trop. 31: 213-216.
- Fraille M., J. & A. Serafino. 1978. Variaciones mensuales en la densidad de microartrópodos edáficos en un cafetal de Costa Rica. Rev. Biol. Trop. 26: 291-301.
- Gaglianone, M.C. 2000. Behavior on flowers, structures associated to pollen transport and nesting biology of *Perditomorpha brunerii* and *Cephalurgus anomalus* (Hymenoptera: Colletidae, Andrenidae). Rev. Biol. Trop. 48: 89-99.
- García Aldrete, A.N. 1984. Psocoptera (Insecta) de nido de rata (*Neotoma floridana smallii* Sherman) en Cayo Largo, Florida. Rev. Biol. Trop. 32: 299-301.
- García Aldrete, A.N. 1981. A New Mexican *Steleops* (Psocoptera: Psocidae). Rev. Biol. Trop. 29: 133-137.
- García Aldrete, A.N. 1997. New South American *Lachesilla* (Psocoptera: Lachesillidae). Rev. Biol. Trop. 44/45: 209-223.
- García Aldrete, A.N. 1999. New North American *Lachesilla* in the *Forcepeta* group (Psocoptera: Lachesillidae). Rev. Biol. Trop. 47: 163-188,
- García Aldrete, A.N.-A. 1978. New Central American *Dasydemella* (Psocoptera= Corrodentia; Amphipsocidae). Rev. Biol. Trop. 26: 153-157.
- García, J.J. & M.V. Micieli. 2000. Estacionalidad poblacional de los estados inmaduros de *Aedes albifascia* (Diptera: Culicidae) en la provincia de Buenos Aires, Argentina. Rev. Biol. Trop. 48: 623-628.
- Gauld, I.D. & D. Lanfranco L. 1987. Los géneros de Ophioninae de Centro y Sudamérica. Rev. Biol. Trop. 35: 257-267.
- Gauld, I.D., J.A. Ugalde Gómez & P. Hanson. 1998. Guía de los Pimplinae de Costa Rica (Hymenoptera: Ichneumonidae). Rev. Biol. Trop. 46 (Suppl. 1): 1-189.
- Genaro, J.A. 2001. Especies nuevas de abejas de Cuba y La Española (Hymenoptera: Colletidae, Megachilidae, Apidae). Rev. Biol. Trop. 49: 1027-1035.
- Genaro, J.A. & G. Alayón. 1994. Las presas (*Trypoxylon* (*Trypalgilum*) *subimpressum* (Hymenoptera: Sphecidae) en Cuba. Rev. Biol. Trop. 42: 353-356.
- Genaro, J.A. 1993. Conducta de nidificación de *Oxybelus analis* (Hymenoptera: Sphecidae). Rev. Biol. Trop. 41: 769-773.
- Genaro, J.A. 1995. Comportamiento de *Bembix americana antilleana* durante la nidificación (Hymenoptera: Sphecidae). Rev. Biol. Trop. 43: 271-275.
- Genaro, J.A. 1997. Key to the genus *Megachile*, *Chalico-doma* group (Hymenoptera: Megachilidae) in Cuba. Rev. Biol. Trop. 44/45: 193-198.
- Genaro, J.A. 1999. Parasitismo entre especies (Diptera, Hymenoptera) en los nidos de *Stictia signata* (Hymenoptera: Sphecidae). Rev. Biol. Trop. 47: 535-538.
- Gilmour, E.F. 1960. On the Neotropical Achatocinini, X. (Coleoptera, Cerambycidae, Lamiinae). Some new species of *Urgleptes* Dillon. Rev. Biol. Trop. 8: 1-24.
- Gilmour, E.F. 1962. Synopsis of the tribe Aerenicini (Coleoptera, Cerambycidae, Lamiinae). Rev. Biol. Trop. 10: 123-148.
- Godoy, C. & M.W. Nielson. 1998. A review of the leafhopper genus *Jikradia* with descriptions of four new species (Homoptera: Cicadellidae). Rev. Biol. Trop. 46: 739-748.
- Gomides, C.H.F., T.M.C. Della Lucia, F.S. Araújo & D.D.O. Moreira. 1997. Velocidad de forrajeo y área foliar transportada por la hormiga *Acromyrmex subterraneanus* (Hymenoptera: Formicidae). Rev. Biol. Trop. 45: 1663-1667.
- González S., E. & R. Novelo G. 1998. *Oplonaeschna magna* sp. nov. (Odonata: Aeshnidae), from Mexico with a description of its larva. Rev. Biol. Trop. 46: 705-715.

- González, A., S. González, D. Castro & A. Armendano. 1998. Desarrollo postembrionario de *Latrodectus variegatus* (Araneae: Theridiidae). Rev. Biol. Trop. 46: 93-99.
- González, J.M., R.W. Matthews & J.B. Terán. 1996. Cortejo en las avispas parasitoides *Melittobia acasta* y *Melittobia australica* (Hymenoptera: Eulophidae). Rev. Biol. Trop. 44: 687-692.
- Gonzalez, J.M. & M.A. Gaiani. 1989. New species of *Eufriesea* (Hymenoptera: Apidae) from Venezuela. Rev. Biol. Trop. 37: 149-152.
- González, O.E. & O.R. Di Iorio. 1997. Plantas hospedadoras de Cerambycidae (Coleoptera) en el noreste de Argentina. Rev. Biol. Trop. 44/45: 167-175.
- Grajales, G.G. & W.T. Wcislo. 1998. Nest architecture of group-living wasps *Microstigmus* (Hymenoptera: Sphecidae): role of the pedicel as a defense against ants. Rev. Biol. Trop. 46: 1141-1143.
- Habib, M.E.M. & J. Vasconcellos-Neto. 1979. Biological studies on *Botanochara impressa* Panzer, 1789 (Coleoptera; Chrysomelidae). Rev. Biol. Trop. 27: 103-110.
- Hansson, C. & K. Nishida. 2002. A new species of *Pedibus* (Hymenoptera: Eulophidae) from *Epilachna* (Coleoptera: Coccinellidae) in Costa Rica. Rev. Biol. Trop. 50: 121-125.
- Hedström, I. & G. Sahlén. 2001. A key to the adult Costa Rican "helicopter" damselflies (Odonata, Pseudostigmatidae) with notes on their phenology and life zone preferences. Rev. Biol. Trop. 49: 1037-1056.
- Hedström, I. 1986. Pollen carriers of *Cocos nucifera* L. (Palmae) in Costa Rica and Ecuador (neotropical región). Rev. Biol. Trop. 34: 297-301.
- Hedström, I. 1988a. Una sustancia natural en la captura de moscas de la fruta del género *Anastrepha* Schiner (Diptera: Tephritidae). Rev. Biol. Trop. 36: 269-272.
- Hedström, I. 1988b. Pollen carriers and fruit development of *Psidium guajava* L. (Myrtaceae) in the Neotropical region. Rev. Biol. Trop. 36: 551-553.
- Hermans, P., R.H. Dwinger, G.M. Buening & M.V. Herrero. 1994. Seasonal incidence and hemoparasite infection rates of ixodid ticks (Acari: Ixodidae) detached from cattle in Costa Rica. Rev. Biol. Trop. 42: 623-632.
- Herrera, A., P. Wygodzinsky & M. Napan. 1972. Presencia de *Trypanosoma rangeli* Tejera, 1920, en el Perú. I. El insecto vector, *Rhodnius ecuadoriensis* Lent & León, 1958. Rev. Biol. Trop. 20: 141-149.
- Herrero, M.V. & G.V. Odell. 1988. Algunas características de los venenos y secreciones digestivas de *Aphonopelma seemanni* y *Sphaerobothria hoffmanni* (Araneae: Theraphosidae) de Costa Rica. Rev. Biol. Trop. 36: 241-246.
- Herrero, M.V., A. Urbina, H. Gutierrez, A. Jimenez, R. Pereira & C. Rivera. 1991. Peridomiciliary latrines and Phlebotominae sandflies (Diptera: Psychodidae) in a focus of Leishmaniasis in Costa Rica. Rev. Biol. Trop. 39: 155-157.
- Herrero, M.V., A.E. Jiménez, J.C. Rojas & A. Dobles. 1993. Índices de similitud entre taxocenosis de flebotomos (Diptera: Psychodidae) en un área endémica de leishmaniasis cutánea en Costa Rica. Rev. Biol. Trop. 41: 761-767.
- Hidalgo-Gato, M.M., R. Rodríguez-León, N.E. Ricardo & H. Ferrás. 1999. Population dynamics of cicadellids (Homoptera: Cicadellidae) in a sugarcane agroecosystem of Cuba. Rev. Biol. Trop. 47: 503-511.
- Hilje, L. 1996. Estacionalidad de adultos de Scarabaeidae (Coleoptera) en Barva, Costa Rica. Rev. Biol. Trop. 44: 719-729.
- Hogue, C.L. & G.B. Fairchild. 1974. A revised check list of the Tabanidae (Diptera) of Costa Rica. Rev. Biol. Trop. 22: 11-28.
- Hogue, C.L. 1984. Observations on the plant hosts and possible mimicry models of "Lantern Bugs" (*Fulgoro* spp.) (Homoptera: Fulgoridae). Rev. Biol. Trop. 32: 145-150.
- Hogue, C.L., T.W. Taylor, A.M. Young & M.E. Platt. 1989. Egg masses and first instar nymphs of some giant neotropical planthoppers (Homoptera: Fulgoridae). Rev. Biol. Trop. 37: 221-226.
- Howard, J.J. 1987. Biological activity of the secretion of *Edessa rufomarginata*, a neotropical pentatomid. Rev. Biol. Trop. 35: 139-141.
- Huber, B.A. 1997. The pholcid spiders of Costa Rica (Araneae: Pholcidae). Rev. Biol. Trop. 45: 1583-1634.
- Hughes, J.B., G.C., Daily & P.R. Ehrlich. 1998. Use of fruit bait traps for monitoring of butterflies (Lepidoptera: Nymphalidae). Rev. Biol. Trop. 46: 697-704.
- Ibarra-Manríquez, G. & R. Dirzo. 1990. Plantas mirmecófilas arbóreas de la Estación de Biología "Los Tuxtlas", Veracruz, México. Rev. Biol. Trop. 38: 79-82.

- Jiménez, C. & M. Springer. 1994. Vertical distribution of benthic macrofauna in Costa Rican crater lake. *Rev. Biol. Trop.* 42: 175-179.
- Jiménez, C. & M. Springer. 1996. Depth related distribution of benthic macrofauna in a Costa Rican crater lake. *Rev. Biol. Trop.* 44: 673-677
- Jirón, L.F. & R. Zeledón. 1982. Preferencias alimentarias de tres especies de Triatominae (Hemiptera: Reduviidae) en condiciones experimentales. *Rev. Biol. Trop.* 30: 151-159.
- Johansen, R.M. & A.N. García Aldrete. 1976. A new Mexican *Dasythrips* (Thysanoptera; Phlaeothripidae). *Rev. Biol. Trop.* 24: 235-242.
- Johansen, R.M. 1998. The *Frankliniella curiosa* species group (Thysanoptera: Thripidae). *Rev. Biol. Trop.* 46: 717-738.
- Jordal, B.H. 1998. New species of *Scolytodes* (Coleoptera: Scolytidae) from Costa Rica and Panama. *Rev. Biol. Trop.* 46: 407-419.
- Kohlmann, B. 1996. Estimación del flujo génico en insectos. El análisis de *Caledia captiva* (Orthoptera: Acrididae). *Rev. Biol. Trop.* 44: 183-191.
- Kohlmann, B. 1997. The Costa Rican species of *Ateuchus* (Coleoptera: Scarabaeidae). *Rev. Biol. Trop.* 44/45: 177-191
- Kohlmann, B. 2000. New species and distribution records of Mesoamerican *Ateuchus* (Coleoptera: Scarabaeidae). *Rev. Biol. Trop.* 48: 235-246.
- Lahmann, E.J. & W.G. Eberhard. 1979. Factores selectivos que afectan la tendencia a agruparse en la araña colonial *Philoponella semiplumosa* (Araneae; Uloboridae). *Rev. Biol. Trop.* 27: 231-240.
- Lattke, J.E. 1986. Notes on the ant genus *Hypoclinea* Mayr, with descriptions of three new species (Hymenoptera: Formicidae). *Rev. Biol. Trop.* 34: 259-265.
- Lattke, J.E. 1990. Una nueva especie de *Pogonomyrmex* Mayr de selva h meda tropical (Hymenoptera: Formicidae). *Rev. Biol. Trop.* 38: 305-309.
- Lichtwardt, R.W. & L.D. G mez. 1993. A new *Coelomomyces* pathogenic to mosquitos in Costa Rica. *Rev. Biol. Trop.* 41: 407-410.
- Lieberman, S. & C.F. Dock. 1982. Analysis of the leaf litter arthropod fauna of a lowland tropical evergreen forest site (La Selva, Costa Rica). *Rev. Biol. Trop.* 30: 27-34.
- L pez, C., A. Corona, M. Araujo & J.E. Rinc n. 1997. Relaci n entre par metros biom tricos y peso seco en insectos acu ticos depredadores de Venezuela. *Rev. Biol. Trop.* 44/45: 641-643.
- Louren o, W.R. & E. M ndez. 1984. Inventario preliminar sobre la fauna de escorpiones de Panam , con algunas consideraciones taxon micas y biogeogr ficas. *Rev. Biol. Trop.* 32: 85-93.
- Louren o, W.R. 1993. A review of the geographical distribution of the genus *Anantheris* Thorell (Scorpiones: Buthidae), with description of a new species. *Rev. Biol. Trop.* 41: 697-701.
- Macaya-Lizano, A.V., R. Pereira & A.M. Espinoza. 1997. Comparaci n de dos m todos de preparaci n de tejido para estudiar la anatom a interna del delf cido *Taegosodes orizicolus* con microscop a de luz y electr nica. *Rev. Biol. Trop.* 45: 927-932.
- Maci , A., J.J. Garc a & R.E. Campos. 1997. Variaci n estacional de tres especies de *Culex* (Diptera: Culicidae) y sus par sitos y pat genos en Punta Lara, provincia de Buenos Aires, Argentina. *Rev. Biol. Trop.* 44/45: 267-275.
- Mackay, W.P. 1998. Dos especies nuevas de hormigas de la tribu Attini de Costa Rica y M xico: *Mycetosoritis vinsoni* y *Mycocepurus curvispinosus* (Hymenoptera: Formicidae). *Rev. Biol. Trop.* 46: 421-425.
- Malavasi, J., F. Ure a & Y. Kozuka. 1981a. Microscop a electr nica de barrido del epitelio digestivo del grillo (*Gryllus* sp.). *Rev. Biol. Trop.* 29: 59-75.
- Malavasi, J., F. Ure a & Y. Kozuka. 1981b. Estudio ultraestructural del epitelio digestivo de *Taeniopoda* y *Schistocerca* (Saltatoria). *Rev. Biol. Trop.* 29: 209-226.
- Mari Mutt, J.A. 1978. New species of springtails from Mexico *Dicranorchesella occulta* sp. n. and a redescription of *D. boneti* (Collembolla; Entomobryidae). *Rev. Biol. Trop.* 26: 125-137.
- Marinkelle, C.J. & E.S. Grose. 1981. A list of ectoparasites of Colombian bats. *Rev. Biol. Trop.* 29: 11-20.
- Marinkelle, C.J. 1965. Direct transmission of *Trypanosoma cruzi* between individuals of *Rhodnius prolixus* Stal. *Rev. Biol. Trop.* 13: 55-58.
- Marinkelle, C.J. 1967. *Triatoma dimidiata capitata*, a natural vector of *Trypanosoma rangeli* in Colombia. *Rev. Biol. Trop.* 15: 203-205.

- Marinkelle, C.J. 1982. Developmental stages of *Trypano-soma cruzi*-like flagellates in *Cavernicola pilosa*. Rev. Biol. Trop. 30: 107-111.
- Marques-Souza, A.C., C. de O. Moura & B.W. Nelson. 1996. Pollen collected by *Trigona williana* (Hymenoptera: Apidae) in Central Amazonia. Rev. Biol. Trop. 44: 567-573.
- Marquis, R.J. 1987. Variación en la herbivoría y su importancia selectiva en *Piper arieianum* (Piperaceae). Rev. Biol. Trop. 35 (Supplement 1): 133-149.
- McGlynn, T.P. & S.E. Kirksey. 2000. The effects of food presentation and microhabitat upon resource monopoly in a ground-foraging ant (Hymenoptera: Formicidae) community. Rev. Biol. Trop. 48: 629-641.
- Mechi, M.R. 1999. Activity cycle of the pollen wasp, *Tri-meria howardi* (Hymenoptera: Vespidae) in Southeastern Brasil. Rev. Biol. Trop. 47: 939-948.
- Meléndez, R.D., A. Coronado, F. Mujica, F. Cerutti & O. Mosquera. 1998. Levels of natural resistance to *Boophilus microplus* (Acari: Ixodidae) in Carora breed bulls. Rev. Biol. Trop. 46: 691-696.
- Menke, A.S. & F. Fernández C. 1996. Claves ilustradas para las subfamilias, tribus y géneros de esfécidos neotropicales (Apoidea: Sphecidae). Rev. Biol. Trop. 44 (Suppl. 2): 1-68.
- Mexzón, R.G. 1997. Recursos alimentarios de *Anastrepha* spp. adultos (Diptera: Tephritidae). Rev. Biol. Trop. 45: 1689-1690.
- Michener, C.D. & K.R. Eickwort. 1966. Observations on nests of *Ceratina* in Costa Rica (Hymenoptera, Apoidea). Rev. Biol. Trop. 14: 279-286.
- Michener, C.D. 1962. An interesting method of pollen collecting by bees from flowers with tubular anthers. Rev. Biol. Trop. 10: 167-176.
- Michener, C.D. 1977. Nests and seasonal cycle of *Neocorynura pubescens* in Colombia (Hymenoptera: Halictidae). Rev. Biol. Trop. 25: 39-42.
- Michener, C.D., M.D. Breed & W.J. Bell. 1979. Seasonal cycles nests and social behavior of some Colombian halictine bees (Hymenoptera; Apoidea). Rev. Biol. Trop. 27: 13-34.
- Mieli, M.V. & J.J. García. 1997. Parasitismo por microsporidios (*Microspora*) en tres especies de mosquitos (Diptera: Culicidae) de la Argentina. Rev. Biol. Trop. 44/45: 635-639.
- Monge-Nájera, J., F. Hernández, M.I. González, J. Soley, J. Araya & S. Zolla. 1998. Spatial distribution, territoriality and sound production by tropical cryptic butterflies (*Hamadryas*, Lepidoptera: Nymphalidae): implications for the "industrial melanism" debate. Rev. Biol. Trop. 46: 297-329.
- Montoya, M. & L.F. de Armas. 2002. Escorpiones (Arachnida) del Archipiélago de Bocas del Toro, Panamá. Rev. Biol. Trop. 50: 155-160.
- Mora Urpi, J. & E.M. Solis. 1980. Polinización en *Bactris gasipaes* H.B.K. (Palmae). Rev. Biol. Trop. 28: 153-174.
- Morais, H.C., I.R. Diniz & D.M.S. Silva. 1999. Caterpillar seasonality in a central Brazilian cerrado. Rev. Biol. Trop. 47: 1025-1033.
- Morales, N.E., J.C. Zanuncio, D. Pratisoli & A.S. Fabres. 2000. Fluctuación poblacional de Scolytidae (Coleoptera) en zonas reforestadas con *Eucalyptus grandis* (Myrtaceae) en Minas Gerais, Brasil. Rev. Biol. Trop. 48: 101-107.
- Mound, L., A.P. Retana & G. Du Heaume. 1993. Claves ilustradas para las familias y los géneros de *Terebrantia* (Insecta: Thysanoptera) de Costa Rica y Panamá. Rev. Biol. Trop. 41: 709-727.
- Mound, L.A. 2002. Thysanoptera biodiversity in the Neotropics. Rev. Biol. Trop. 50: 477-484.
- Moure, J.S. 1963. Una nueva especie de *Eulaema* de Costa Rica (Hymenoptera, Apoidea). Rev. Biol. Trop. 11: 211-216.
- Moure, J.S. 1964. A key to the parasitic Euglossine Bees and a new species of *Exaerete* from México (Hymenoptera-Apoidea). Rev. Biol. Trop. 12: 15-18.
- Moure, J.S. 1967. The Central American species of *Euglossa* subgenus *Glossura* Cockerell, 1917 (Hymenoptera, Apidae). Rev. Biol. Trop. 15: 227-248.
- Muñoz-Quesada, F. 1999. El género *Leptonema* (Trichoptera: Hydropsychidae) en Costa Rica, con la descripción de una nueva especie. Rev. Biol. Trop. 47: 959-1006.
- Nelson, J.M. 1970. Nesting habits and nest symbionts of *Polistes erythrocephalus* Latreille (Hymenoptera: Vespidae) in Costa Rica. Rev. Biol. Trop. 18: 89-98.
- Nova Coelho, L.B. & E.R. Da-Silva. 2002. A new species of *Scaris* from southeastern Brazil, with notes on S.

- nessimiani* and *S. bahiensis* (Homoptera: Cicadellidae). Rev. Biol. Trop. 50: 685-687.
- Nova Coelho, L.B. 1999. The male of *Nancyana curva* (Homoptera: Cicadellidae) from southeastern Brazil. Rev. Biol. Trop. 47: 1021-1023.
- Opina-Torres, R. 1998. Revisión de la morfología genital masculina de *Eulaema* (Hymenoptera: Apidae). Rev. Biol. Trop. 46: 749-762.
- Ospina T. R., A. Lievano & G. Nates. 1987. El patrón de coloración del abejorro social *Bombus atratus*, Franklin, en Cundinamarca, Colombia: una población diferenciada. Rev. Biol. Trop. 35: 317-324.
- Pakaluk, J. 1988. Review of the New World species of *Pharaxonotha* Reitter (Coleoptera: Languriidae). Rev. Biol. Trop. 36: 447-451.
- Parnell, J.R. 1968. Observations on the fauna directly connected with sedges of the genus *Cyperus* in Costa Rica, Central America. I. *Sibariops confusus* (Boh) (Curculionidae) on *Cyperus ferax* L. Rich. Rev. Biol. Trop. 16: 247-254.
- Patel, P.N. & M.E.M. Habib. 1978. Biological and behavioral studies of an ovoviparous earwing, *Marava arachidis* (Yersin, 1860) (Dermaptera; Forficulidae). Rev. Biol. Trop. 26: 385-389.
- Pedro, S.R.M. & J.M.F. Camargo. 1997. A new species of *Partamona* (Hymenoptera: Apidae) endemic to eastern Panama, and the male of *P. grandipennis*. Rev. Biol. Trop. 44/45: 199-208.
- Pereira, J.M.M., T. V. Zanuncio, J. C. Zanuncio & A. Pallini. 2001. Lepidoptera pests collected in *Eucalyptus urophylla* (Myrtaceae) plantations during five years in Três Marias, State of Minas Gerais, Brazil. Rev. Biol. Trop. 49: 1073-1082.
- Pereira, M.J.B., N. dos Anjos & A.E. Eiras. 1998. Cortejo y cópula en la broca de la semilla de guanábana *Bephratelloides pomorum* (Hymenoptera: Eurytomidae). Rev. Biol. Trop. 46: 105-108.
- Pérez, R., R. Condit & S. Lao. 1999. Distribución, mortalidad y asociación con plantas, de nidos de *Parapo-nera clavata* (Hymenoptera: Formicidae) en la isla de Barro Colorado Island, Panamá. Rev. Biol. Trop. 47: 697-709.
- Peronti, A.L.B.G. & C.R. Sousa-Silva. 2002. Aphids (Hemiptera: Aphidoidea) of ornamental plants from São Carlos, São Paulo state, Brazil. Rev. Biol. Trop. 50: 137-144.
- Pfannes, K.R. & A.C. Baier. 2002. "Devil's Gardens" in the Ecuadorian Amazon - Association of the allelopathic tree *Duroia hirsuta* (Rubiaceae) and its "gentle" ants. Rev. Biol. Trop. 50: 293-301.
- Phillips R., E. & M.A. Solis. 1996. *Neurophyseta* (Lepidoptera: Crambidae) de Costa Rica. Rev. Biol. Trop. 44: 693-717.
- Post, D.C. 1981. Observations on female nesting and behavior of *Stictia signata* (Hymenoptera: Sphecidae) in Brazil. Rev. Biol. Trop. 29: 105-113.
- Quate, L.W. 1996. Preliminary taxonomy of Costa Rican Psychodidae (Diptera), exclusive of Phlebotominae. Rev. Biol. Trop. 44 (Suppl. 1): 1-81.
- Quezada, J.R., J.R. Alegría & J.D. Velasco. 1973. Efecto de los insecticidas en el equilibrio natural de poblaciones de *Rothschildia aroma* Schaus (Lepidoptera: Saturniidae) en El Salvador. Rev. Biol. Trop. 21: 111-126.
- Rabinovich, J.E. 1971. Population dynamics of *Telenomus fariai* (Hymenoptera: Scelionidae), a parasite of Chagas' disease vectors. V. Parasite size and vital space. Rev. Biol. Trop. 19: 109-120.
- Rafael, J.A. & M.D. da S. Menezes. 1999. Taxonomic review of Costa Rican Pipunculidae (Diptera, Insecta). Rev. Biol. Trop. 47: 513-534.
- Ramírez B., W. & J. Montero S. 1988. *Ficus microcarpa* L., *F. benjamina* L. and other species introduced in the New World, their pollinators (Agaonidae) and other fig wasps. Rev. Biol. Trop. 36: 441-446.
- Ramírez B., W. & J.R. Navarro F. 1993. Infestation of the mite *Varroa jacobsoni* in worker and drone honey bee (*Apis mellifera*) brood in France and Brazil. Rev. Biol. Trop. 41: 883-886.
- Ramírez B., W. 1991. Evolution of the mandibular appendage in fig wasps (Hymenoptera: Agaonidae). Rev. Biol. Trop. 39: 87-95.
- Ramírez, A. 1997. Lista de especies costarricenses del orden Odonata (Insecta) de las que se conoce la náyade. Rev. Biol. Trop. 44/45: 225-232.
- Ramírez, A., D.R. Paulson & C. Esquivel. 2000. Odonata of Costa Rica: Diversity and checklist of species. Rev. Biol. Trop. 48: 247-254.
- Ramírez, W. & J. Malavasi 1997. Fig wasps: mechanisms of pollen transfer in *Malvanthera* and *Pharmacosycea* figs (Moraceae). Rev. Biol. Trop. 45: 1635-1640.

- Ramírez, W. 1982. *Bombus mexicanus* Cresson, un hospedante de *Melaloncha* moscas parásitas de la abeja de miel en el nuevo mundo. Rev. Biol. Trop. 30: 177.
- Ramírez, W. 1984. Biología del género *Melaloncha* (Phoridae) moscas parasitoides de la abeja doméstica (*Apis mellifera* L.) en Costa Rica. Rev. Biol. Trop. 32: 25-28.
- Ramírez, W. 1997. Breathing adaptations of males in fig gall flowers (Hymenoptera: Agaonidae) Rev. Biol. Trop. 44/45: 277-282.
- Ramos, B. & S. Urdaneta-Morales. 1977. Hematophagous insects as vectors for frog trypanosomes. Rev. Biol. Trop. 25: 209-218.
- Raw, A. 1977. The biology of two *Exomalopsis* species (Hymenoptera: Anthophoridae) with remarks on sociality in bees. Rev. Biol. Trop. 25: 1-12.
- Raw, A. 1979. *Centris dirrhoda* (Anthophoridae), the bee visiting West Indian cherry flowers (*Malpighia puniceifolia*). Rev. Biol. Trop. 27: 203-206.
- Retana S., A.P. 1998a. Reestablecimiento de los géneros *Frankliniella*, *Exophthalmothrips* y *Bolbothrips* (Thysanoptera: Thripidae). Rev. Biol. Trop. 46: 385-395.
- Retana S., A.P. 1998b. Una visión filogenética de *Frankliniella* (Thysanoptera: Thripidae). Rev. Biol. Trop. 46: 397-405.
- Retana S., A.P., S. Ramírez & M. Peinador. 1997. Tabla de vida y observaciones de las agallas de *Gynaicothrips ficorum* (Thysanoptera: Phlaeothripidae) en el campo. Rev. Biol. Trop. 44/45: 651-653.
- Retana, A. & L.A. Mound. 1994. Thrips of the *Frankliniella minuta* group (Insecta: Thysanoptera) in Costa Rican Asteraceae flowers. Rev. Biol. Trop. 42: 639-648.
- Rifkind, D. 1997. Two new species of Cleridae (Coleoptera) from a Costa Rican cloud forest. Rev. Biol. Trop. 45: 1117-1124.
- Rodríguez S., R.L. 1998. Copulation, fighting behavior and life cycle of *Neopamera bilobata* (Heteroptera: Lygaeidae). Rev. Biol. Trop. 46: 837-840.
- Rodríguez, M.A., T.S. Olivares & A.O. Angulo. 2001. Nuevas especies altoandinas VII (Lepidoptera: Noctuidae). Rev. Biol. Trop. 49: 317-328.
- Rojas, L., C. Godoy, P. Hanson & L. Hilje. 2001. A survey of homopteran species (Auchenorrhyncha) from coffee shrubs and poró and laurel trees in shaded coffee plantations, in Turrialba, Costa Rica. Rev. Biol. Trop. 49: 1057-1065.
- Rosabal, R. & A. Trejos. 1964. *Phlebotomus* de El Salvador (Diptera: Psychodidae) I. Especies conocidas. Rev. Biol. Trop. 12: 167-174.
- Rosabal, R. & A. Trejos. 1965. *Phlebotomus* de El Salvador (Diptera, Psychodidae). II. Observaciones sobre su biología con especial referencia a *P. longipalpis*. Rev. Biol. Trop. 13: 219-228.
- Roubik, D.W. 1980. New species of *Trigona* and cleptobiotic *Lestrimelitta* from French Guiana (Hymenoptera: Apidae). Rev. Biol. Trop. 28: 263-269.
- Roubik, D.W. 1981. Comparative foraging behavior of *Apis mellifera* and *Trigona corvina* (Hymenoptera: Apidae) on *Baltimora recta* (Compositae). Rev. Biol. Trop. 29: 177-183.
- Ruíz, A. 1958. Contribución al estudio del género *Phytomonas* Donovan en Costa Rica II. *Phytomonas elmassiani*. Rev. Biol. Trop. 6: 263-272.
- Sakagami, S.F. & J.F.M. Camargo. 1964. Cerumen collection accompanied by thieving and attacking in a stingless bee, *Nannotrigona* (*Scaptotrigona*) *postica* (Latreille), with a consideration on territoriality in social insects. Rev. Biol. Trop. 12: 197-208.
- Sanjuán, T., L. G. Henao & G. Amat. 2001. Distribución espacial de *Cordyceps* spp. (Ascomycotina: Clavicipitaceae) y su impacto sobre las hormigas en selvas del piedemonte amazónico de Colombia. Rev. Biol. Trop. 49: 945-955.
- Santos, G.P., T. V. Zanuncio, S. L. de Assis Junior & J.C. Zanuncio. 1997. Daños por *Sennius amazonicus*, *Sennius* sp. and *Amblycerus* sp. (Coleoptera: Bruchidae) en semillas de *Sclerolobium* sp. (Leguminosae). Rev. Biol. Trop. 45: 883-886.
- Savini, V. 1994. Dos especies nuevas y un nuevo registro para América Central del género *Gioia* (Coleoptera: Chrysomelidae). Rev. Biol. Trop. 42: 189-193.
- Scarborough, A.G. 1993. Revision of the New World species of *Ommatius* Wiedemann (Diptera: Asilidae): the neotropical *costatus* species group. Rev. Biol. Trop. 41: 729-753.
- Serafino, A. & J. Fraile Merino. 1978. Poblaciones de microartrópodos en diferentes suelos de Costa Rica. Rev. Biol. Trop. 26: 139-151.
- Sierra, A., D., I.D. Vélez B. & S. Uribe S. 2000. Identificación de *Lutzomyia* spp. (Diptera: Psychodidae)

- grupo *verrucarum* por medio de microscopia electrónica de sus huevos. *Rev. Biol. Trop.* 48: 615-622.
- Silva-Matos, E.V. da & C.A. Garófalo. 2000. Worker life tables, survivorship, and longevity in colonies of *Bombus (Fervidobombus) atratus* (Hymenoptera: Apidae). *Rev. Biol. Trop.* 48: 657-663.
- Silveira, R.D. & N. dos Anjos. 2001. Actividad reproductiva de *Coelomera lanio* (Coleoptera: Chrysomelidae). *Rev. Biol. Trop.* 49: 1067-1071.
- Silveira, R.D., N. dos Anjos & J.C. Zanuncio. 2002. Natural enemies of *Coelomera lanio* (Coleoptera: Chrysomelidae) in the region of Viçosa, Minas Gerais, Brazil. *Rev. Biol. Trop.* 50: 117-120.
- Sittenfeld, A., L. Uribe-Lorío, M. Mora, V. Nielsen, G. Arrieta & D.H. Janzen. 2002. Does a polyphagous caterpillar have the same gut microbiota when feeding on different species of food plants? *Rev. Biol. Trop.* 50: 547-560.
- Soto-Manitiu, J. & H.J. Lezama. 1988. Population fluctuations of *Ropalomera Wiedemann* (Diptera: Ropalomeridae) in Costa Rica. *Rev. Biol. Trop.* 36: 549-550.
- Spencer, K.A. 1983. Leaf mining Agromyzidae (Diptera) in Costa Rica. *Rev. Biol. Trop.* 31: 41-67.
- Staines, C.L. 1996. The genus *Cephaloleia* (Coleoptera: Chrysomelidae) in Central America and the West Indies. *Rev. Biol. Trop.*, Special Publication No. 3: 3-87.
- Suárez, E. & V. Blanco. 1991. Agallas del tallo de *Quercus corrugata* (Fagaceae) y sus insectos asociados. *Rev. Biol. Trop.* 39: 307-308.
- Swanson, H.F. & J. Monge-Nájera. 2000. The effects of methodological limitations in the study of butterfly behavior and demography: a daily study of *Vanessa atalanta* (Lepidoptera: Nymphalidae) for 22 years. *Rev. Biol. Trop.* 48: 605-613.
- Thompson, V. 1997. Spittlebug nymphs (Homoptera: Cercopidae) in *Heliconia* flowers (Zingiberales: Heliconiaceae): Preadaptation and evolution of the first aquatic Homoptera. *Rev. Biol. Trop.* 45: 905-912.
- Tonhasca, A. Jr. & M.A. Lima Bragança. 2000. Forager size of the leaf-cutting ant *Ata sexdens* (Hymenoptera: Formicidae) in a mature eucalyptus forest in Brazil. *Rev. Biol. Trop.* 48: 983-988.
- Tonn, R. & K. Arnold. 1965. Ectoparásitos de aves y mamíferos de Costa Rica. 3. Malófagos. *Rev. Biol. Trop.* 13: 311-316.
- Tonn, R.J. & K. Arnold. 1963. Ectoparásitos de aves y mamíferos de Costa Rica. 1. Diptera. *Rev. Biol. Trop.* 11: 171-176.
- Torres, J.B., J.C. Zanuncio, M.C. Picanço & A.C. de Oliveira. 1997. Parámetros poblacionales de tres parasitoides (Hymenoptera: Scelionidae, Encyrtidae) utilizando al depredador *Podisus nigrispinus* (Hemiptera: Pentatomidae) como hospedero. *Rev. Biol. Trop.* 44/45: 233-240.
- Travis, B.V. & M. Vargas V. 1978. Bionomics of black flies (Diptera: Simuliidae) in Costa Rica. VI. Correlations with ecological factors. *Rev. Biol. Trop.* 26: 335-345.
- Travis, B.V., M. Vargas V. & F. Fallas B. 1979. Bionomics of black flies (Diptera: Simuliidae) in Costa Rica. III. Larval population dynamics in five selected streams. *Rev. Biol. Trop.* 27: 135-144.
- Travis, B.V., M. Vargas V. & J.C. Swartzwelder. 1974. Bionomics of black flies (Diptera: Simuliidae) in Costa Rica. I. Species biting man, with an epidemiological summary for the Western Hemisphere. *Rev. Biol. Trop.* 22: 187-200.
- Trejos, A., R. Trejos & R. Zeledón. 1971. Aracnidismo por *Phoneutria* en Costa Rica (Araneae: Ctenidae). *Rev. Biol. Trop.* 19: 241-250.
- Trejos, A.R. Rosabal & A.Y. de Hernández. 1966. Fecundación de una hembra de *Rhodnius prolixus* Stal, 1852, por dos machos. *Rev. Biol. Trop.* 14: 105-110.
- Valerio G., C.E. 1979. Arañas terafósidas de Costa Rica (Araneae: Theraphosidae). II. *Psalmopoeus reduncus*, redescipción, distribución y el problema de dispersión en terafósidas. *Rev. Biol. Trop.* 27: 301-308.
- Valerio, C.E. 1984. Two alternative strategies for spider egg parasitoids. *Rev. Biol. Trop.* 32: 123-128.
- Valerio, C.E. 1988. Notes on phenology and pollination of *Xanthosoma wendlandii* (Araceae) in Costa Rica. *Rev. Biol. Trop.* 36: 55-61.
- Valerio, C.E. 1970. Parasitismo en huevos de araña *Achae - ranea tepidariorum* (Koch) (Aranea: Theridiidae) en Costa Rica. *Rev. Biol. Trop.* 18: 99-106.
- Valerio, C.E. 1980. Arañas terafósidas de Costa Rica (Araneae; Theraphosidae). III. *Sphaerobothria*, *Aphonopelma*, *Pterinopelma*, *Citharacanthus*, *Crypsidromus* y *Stichoplastus*. *Rev. Biol. Trop.* 28: 271-296.
- Vargas, V., M. & B.V. Travis. 1973. Bionomía de los simúlidos (Diptera: Simuliidae) en Costa Rica. IV.

- Localización y descripción de los lugares de recolección. Rev. Biol. Trop. 21: 143-175.
- Vargas, V., M. & J. Ramírez P. 1988. *Gigantodax bierigi* & *G. willei* (Diptera: Simuliidae), two black fly species from Costa Rica. Rev. Biol. Trop. 36: 457-469.
- Vargas, V., M. & J.V. Vargas C. 1997. Especies y distribución geográfica de los subgéneros de *Simulium* (Diptera: Simuliidae) en Costa Rica. Rev. Biol. Trop. 45: 1139-1146.
- Vargas, V., M. 1984. Occurrence of the bat tick *Ornithodoros (Alectorobius) kelleyi* Cooley & Kohls (Acari: Argasidae) in Costa Rica and its relation to human bites. Rev. Biol. Trop. 32: 103-107.
- Vargas, V., M., B.V. Travis, A. Diaz Najera & F. Fallas B. 1977. Bionomics of black flies (Diptera: Simuliidae) in Costa Rica. VII. Genus *Simulium* subgenus *Hearlea*. Rev. Biol. Trop. 25: 137-150.
- Vargas, V., M., I.A. Rubstov & F. Fallas B. 1980. Bionomics of black flies (Diptera: Simuliidae) in Costa Rica. V. Description of *Neomesomermis travisi* sp. n. (Nematoda: Mermithidae). Rev. Biol. Trop. 28: 73-89.
- Vargas, L. 1960. The subgenera of *Culicoides* of the Americas (Diptera, Ceratopogonidae). Rev. Biol. Trop. 8: 35-48.
- Vargas, M. 1961. Algunas observaciones sobre los hábitos de *Anopheles (N.) albimanus* y *Anopheles (A.) punctimacula* adultos, en la localidad de Matapalo (Puntarenas) Costa Rica. Rev. Biol. Trop. 9: 153-170.
- Vargas, M. 1962. Algunas observaciones sobre pruebas biológicas de pared en la localidad de Matapalo (Puntarenas) con *Anopheles (A.) punctimacula*. Rev. Biol. Trop. 10: 237-242.
- Vargas, M., W. González & J. Vargas. 1990. Especies y distribución geográfica del subgénero *Hemicnetha* (Diptera: Simuliidae) en Costa Rica. Rev. Biol. Trop. 38: 409-414.
- Vargas, M.V. 1956. Llave numérica para identificación de larvas en cuarta fase de Anophelini en Costa Rica. Rev. Biol. Trop. 4: 27-34.
- Vásquez, L.L., R. Jiménez, M. de la Iglesia, A. Mateo & M. Borges. 1997. Plantas hospederas de *Bemisia tabaci* (Homoptera: Aleyrodidae) en Cuba. Rev. Biol. Trop. 44/45: 143-148.
- Venzon, M., J.A.M. Ferreira & J.G. Ripposati. 1999. Parasitism of stink bug eggs (Hemiptera: Pentatomidae) of soybean fields in the Triângulo Mineiro, Minas Gerais, Brazil. Rev. Biol. Trop. 47: 1007-1013.
- Vergara, B., C., A. Villa L. & G. Nates P. 1986. Nidificación de meliponinos (Hymenoptera: Apidae) de la Región Central de Colombia. Rev. Biol. Trop. 34: 181-184.
- Vivan, L.M., J.B. Torres, R. Barros y A.F.S.L. Veiga. 2002. Tasa de crecimiento poblacional del chinche depredador *Podisus nigrispinus* (Heteroptera: Pentatomidae) y de la presa *Tuta absoluta* (Lepidoptera: Gelechiidae) en invernadero. Rev. Biol. Trop. 50: 145-153.
- Vives, N. & Zeledón, R. 1957. Observaciones parasitológicas en ratas de San José. Rev. Biol. Trop. 5: 173-194.
- Weislo, W.T. 1990. Parasitic and courtship behavior of *Phalacrotophora halictorum* (Diptera: Phoridae) at a nesting site of *Lasioglossum figueresi* (Hymenoptera: Halictidae). Rev. Biol. Trop. 38: 205-209.
- Weir, L., E.H. & L. Sagarzazu. 1998. Interspecific competition between *Metagonystylum minense* (Diptera: Tachinidae) and *Cotesia flavipes* (Hymenoptera: Braconidae) parasitoids of sugarcane borers (*Diatraea* spp., Lepidoptera: Pyralidae). Rev. Biol. Trop. 46: 1135-1139.
- Wille, A. 1960. A new species of stingless bee (Meliponini) from Bolivia. Rev. Biol. Trop. 8: 219-224.
- Wille, A. 1961. Evolutionary trends in the ventral nerve cord the stingless bees (Meliponini). Rev. Biol. Trop. 9: 117-130.
- Wille, A. 1962. A new species of stingless bee (Meliponini) from Costa Rica. Rev. Biol. Trop. 10: 177-182.
- Wille, A. 1963a. Phylogenetic significance of an unusual African stingless bee, *Meliponula bocandei* (Spino-la). Rev. Biol. Trop. 11: 25-46.
- Wille, A. 1963b. Behavioral adaptations of bees for pollen collecting from *Cassia* flowers. Rev. Biol. Trop. 11: 205-210.
- Wille, A. 1964. Notes on a primitive stingless bee, *Trigona (Nogueirapis) mirandula*. Rev. Biol. Trop. 12: 117-151.
- Wille, A. 1965a. A new species of stingless bee (Meliponini) from Costa Rica. Rev. Biol. Trop. 13: 139-142.
- Wille, A. 1965b. Las abejas atarrá de la región mesoamericana del género y subgénero *Trigona* (Apidae-Meliponini). Rev. Biol. Trop. 13: 271-292.

- Wille, A. 1966. Notes on two species of stingless ground-nesting bees (*Trigona mirandula* and *Trigona buchwaldi*) from the Pacific rain forest of Costa Rica. *Rev. Biol. Trop.* 14: 251-278.
- Wille, A. 1967. A new species of stingless bee *Trigona (Plebeia)* from Costa Rica, with descriptions of its behavior and cluster-type nest. *Rev. Biol. Trop.* 15: 299-314.
- Wille, A. 1970. Notes on the morphology of the musculature of the salivary syringe and neck region of bees. *Rev. Biol. Trop.* 18: 33-52.
- Wille, A. 1973. Observations on the behavior of a tropical rain forest dung beetle, *Megathoposoma candezei* (Harold), Coleoptera: Scarabaeidae. *Rev. Biol. Trop.* 21: 41-58.
- Wille, A. 1976. Las abejas jicotes del género *Melipona* (Apidae: Meliponini) de Costa Rica. *Rev. Biol. Trop.* 24: 123-148.
- Wille, A. 1977. A general review of the fossil stingless bees. *Rev. Biol. Trop.* 25: 43-46.
- Wille, A. 1979a. Comparative study of the pollen press and nearby structures in the bees of the family Apidae. *Rev. Biol. Trop.* 27: 217-222.
- Wille, A. 1979b. Phylogeny and relationships among the genera and subgenera of the stingless bees (Meliponinae) of the world. *Rev. Biol. Trop.* 27: 241-278.
- Wille, A. 1985. Las abejas *Peponapis* y *Xenoglossa* en Costa Rica y su importancia en la polinización de las *Cucurbita domestica*. *Rev. Biol. Trop.* 33: 17-24.
- Wille, A. & L.C. Chandler. 1964. A new stingless bee from the tertiary amber of the Dominican Republic (Hymenoptera; Meliponini). *Rev. Biol. Trop.* 12: 187-196.
- Wille, A. & G. Fuentes. 1975. Efecto de la ceniza del Volcán Irazú (Costa Rica) en algunos insectos. *Rev. Biol. Trop.* 23: 165-176.
- Wille, A. & C.D. Michener. 1962. Inactividad estacional de *Megacephala sobrina* Dejean (Coleoptera, Cicindelidae). *Rev. Biol. Trop.* 10: 161-166.
- Wille, A. & C.D. Michener. 1970. Observations on the nests of Costa Rican *Halictus* with taxonomic notes on Neotropical species (Hymenoptera: Halictidae). *Rev. Biol. Trop.* 18: 17-32.
- Wille, A. & C.D. Michener. 1973. The nest architecture of stingless bees with special reference to those of Costa Rica. (Hymenoptera: Apidae). *Rev. Biol. Trop.* (Suppl. 1): 3-278.
- Wille, A. & E. Orozco. 1969. The life cycle and behavior of the social bee *Lasioglossum (Dialictus) umbripennis* (Hymenoptera: Halictidae). *Rev. Biol. Trop.* 17: 199-246.
- Wille, A. & E. Orozco. 1974. Observations on the founding of a new colony by *Trigona cupira* (Hymenoptera: Apidae) in Costa Rica. *Rev. Biol. Trop.* 22: 253-288.
- Wille, A., E. Orozco, G. Fuentes & E. Solis. 1974. Additional observations on the behavior of a tropical forest dung beetle, *Megathoposoma candezei* (Coleoptera: Scarabaeidae). *Rev. Biol. Trop.* 22: 129-134.
- Wille, A., E. Orozco & C. Raabe. 1983. La polinización del chayote *Sechium edule* (Jacq.) Swartz en Costa Rica. *Rev. Biol. Trop.* 31: 145-154.
- Wood, S.L., G.C. Stevens & H.J. Lezama. 1991a. Los Scolytidae de Costa Rica: clave de generos y de la subfamilia Hylesinae (Coleoptera). *Rev. Biol. Trop.* 39: 125-148.
- Wood, S.L., G.C. Stevens & H.J. Lezama. 1991b. Scolytidae (Coleoptera) de Costa Rica. clave para Scolytini, Ctenophorini, Micracini, Ipini, Dryocoetini, Xyleborini y Cryphalini. *Rev. Biol. Trop.* 39: 279-306.
- Wood, S.L., G.C. Stevens & H.J. Lezama. 1992. Los Scolytinae, Tribu Corthylini. *Rev. Biol. Trop.* 40: 247-286.
- Young, A.M. & A. Muysshondt. 1972. Geographical and ecological expansion in tropical butterflies of the genus *Morpho* in evolutionary time. *Rev. Biol. Trop.* 20: 231-264.
- Young, A.M. 1971. Mimetic associations in natural populations of tropical papilionid butterflies. I. Life history and structure of a tropical dry forest breeding population of *Battus polydamus polydamus*. *Rev. Biol. Trop.* 19: 211-240.
- Young, A.M. 1975. Feeding behavior of *Morpho* butterflies (Lepidoptera: Nymphalidae: Morphinae) in a seasonal tropical environment. *Rev. Biol. Trop.* 23: 101-132.
- Young, A.M. 1976. Notes on the faunistic complexity of cicadas (Homoptera; Cicadidae) in northern Costa Rica. *Rev. Biol. Trop.* 24: 267-280.
- Young, F.N. 1980. Predaceous water beetles of the genus *Desmopachria* Babington: the subgenera with

- descriptions of new taxa (Coleoptera: Dytiscidae). Rev. Biol. Trop. 28: 305-321.
- Zanetti, R., E.F. Vilela, J.C. Zanuncio & J.I.L. Moura. 1999. Búsqueda de alimento y marcación de trillo por larvas de *Brassolis sophorae* (Lepidoptera: Nymphalidae) en condiciones naturales. Rev. Biol. Trop. 47: 1035-1038.
- Zanuncio, J.C., H.N. Oliveira, J.B. Torres & D. Pratissoli. 2000. Egg Parasitoids of *Podisus sculptus* Distant (Heteroptera: Pentatomidae) in an *Eucalyptus* Plantation in the Brazilian Amazonian Region. Rev. Biol. Trop. 48: 989-992.
- Zeledón, R. & C. Ponce. 1972. Descripción de una nueva especie de *Triatoma* de Honduras, América Central (Hemiptera; Reduviidae). Rev. Biol. Trop. 20: 275-280.
- Zeledón, R. & E. Blanco. 1965. Relaciones huésped-parásito en Tripanosomiasis Rangeli I. Infección intestinal y hemolinfática comparativa de *Rhodnius prolixus* y *Triatoma infestans*. Rev. Biol. Trop. 13: 143-156.
- Zeledón, R. & E.I. Morua. 1963. Análisis electroforético de la hemolinfa de algunas especies de triatómidos (Hemiptera: Reduviidae). Rev. Biol. Trop. 11: 185-196.
- Zeledón, R. & M. Vargas. 1955. *Panstrongylus rufotuberculatus* (Champion, 1899) en Costa Rica y breve mención de las especies costarricenses de Triatominae (Hemiptera, Reduviidae). 3: 179-182.
- Zeledón, R. & P.L. Vieto. 1957b. Susceptibilidad de varias especies de triatomidos a una cepa costarricense de *Schizotrypanum cruzi* Chagas, 1909. Rev. Biol. Trop. 5: 195-200.
- Zeledón, R. & P.L. Vieto. 1957a. Contribucion al estudio de los Simúlidos de Costa Rica (Diptera: Nematocera) I.-Sobre el *Simulium panamense* Fairchild, 1940. Rev. Biol. Trop. 5: 19-34.
- Zeledón, R. 1953. Manifestaciones alergicas consecuentes a la picada de triatomas (Hemiptera, Reduviidae). Rev. Biol. Trop. 1: 17-20.
- Zeledón, R. 1955. Inmunidad natural de algunos Triatominae al *Trypanosoma equinum* Vogues, 1901. Rev. Biol. Trop. 3: 171-178.
- Zeledón, R. 1956a. Hallazgo de formulas evolutivas de *Trypanosoma rangeli* Tejera, 1919, en glandulas salivales de *Rhodnius prolixus* Stal, 1859, salvadoreños. Rev. Biol. Trop. 4: 1-8.
- Zeledón, R. 1956b. Anotaciones sobre una curiosa oviposicion de la mosca del tórsalo en condiciones experimentales (Diptera: Cuterebridae). Rev. Biol. Trop. 4: 179-186.
- Zeledón, R. 1957a. Sobre la biología del *Telenomus fariai* Lima, 1927 (Hymenoptera: Scelionidae), parásito endófago de huevos de algunos Triatominae. Rev. Biol. Trop. 5: 1-18.
- Zeledón, R. 1957b. Algunas observaciones sobre la biología de la *Dermatobia hominis* (L.Jr.) y el problema del tórsalo en Costa Rica. Rev. Biol. Trop. 5: 63-76.
- Zeledón, R. 1965. *Trypanosoma rangeli* en glándulas salivales de *Rhodnius pallescens* de Panamá. Rev. Biol. Trop. 13: 157-159.
- Zeledón, R., O. Jiménez & R.R. Brenes. 1957. *Cuterebra baeri* Shannon y Greene, 1926 en el mono aullador de Costa Rica. Rev. Biol. Trop. 5: 129-134.