MELISSA

The Melittologist's Newsletter

Ronald J. McGinley, Bryan N. Danforth, Maureen J. Mello
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COLLECTING NEWS

Report on the first PCAM expedition to northern Mexico

By
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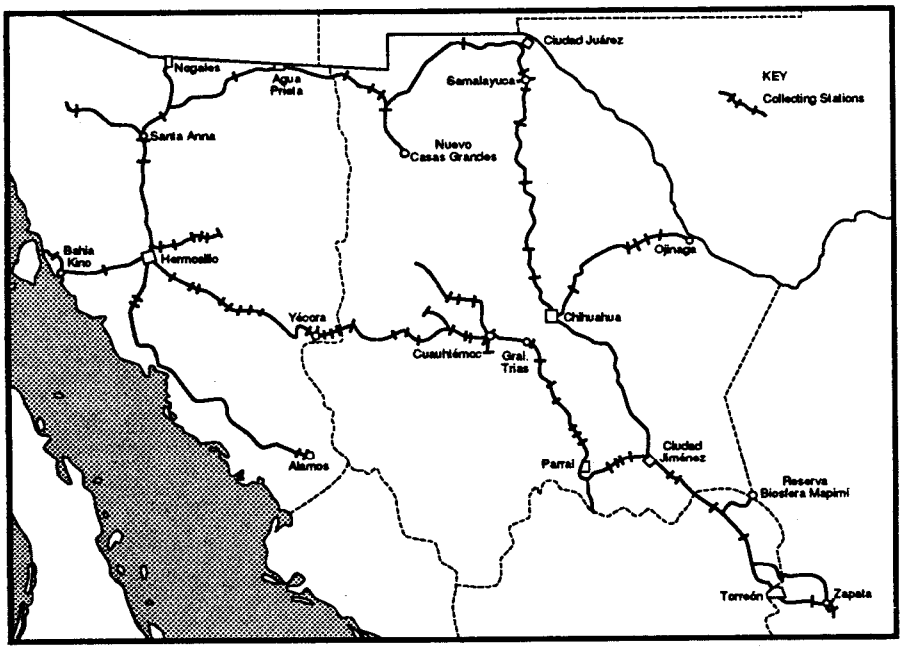
The first PCAM expedition to Mexico, supported by the U.S. National Science Foundation, explored the northern, arid regions of Mexico as well as the Sierra Madre Occidental, separating the Sonoran and Chihuahuan Deserts.



The trip began on August 12 in Hermosillo, Sonora, (see map) and included Ricardo Ayala (Estacion de Biologia, Universidad Autonoma de México [UNAM], Chamela), Alberto Búrquez (Centro de Ecologia, UNAM, Hermosillo), Luis Godinez (Centro de Ecologia, UNAM), Terry Griswold (Bee Biology and Systematics Lab., USDA), Bob Minckley (University of Kansas), Jack Neff (Central Texas Melittological Institute), Adrián Quijada (Centro de Ecologia, UNAM), Dr. and Mrs. Wallace LaBerge (Illinois Natural History Survey) and Nancy Pember (American Museum of Natural History). The trip was organized and lead by Alberto Búrquez and myself. Jack Neff collected and pressed all plant specimens, which were subsequently identified at the University of Texas, Austin, thanks to the efforts of Dr. Berle Simpson and her staff.

For the first four days, as the group participants gathered in Hermosillo, collecting trips were taken to the west of Hermosillo, to the Sea of Cortez, and in the mountains to the east of Hermosillo (see map). Unfortunately, flowering in the lowlands of Sonora had been delayed because the late summer rainy season had started only shortly before our arrival. The mountains to the east-northeast of Hermosillo (toward Moctezuma), however, provided excellent collecting. On a single day trip along the Rio Sonora 1,200 specimens were collected. Other collecting highlights around Hermosillo included finding *Calliopsis anomoptera* and *C. limbus*, two *Euphorbia* bees not previously collected so far south.

On August 16 the group departed eastward from Hermosillo to Yécora, Sonora, where specimens of *Thygater cockerelli* were collected. This is the first record of this genus from Sonora and the first record west of the Continental Divide. This species was fairly common further east, in Cuahtémoc. The collection of *Bombus ephippatus* at Yécora also extends the range of this common Mexican bumblebee into Sonora. Specimens of *Colletes platycnema*, the largest member of the genus in the New World, were also collected here. Perhaps the most interesting collections at Yécora were specimens of the predominantly tropical meliponine genus *Partamona*.

Further east, in Chihuahua, we found new species of *Conanthalictus* and *Eufriesia* at General Trias. The magnificent, all metallic-blue *Eufriesia* was collected visiting yellow-flowered *Solanum*, and extends the range of this tropical genus far to the north. A new species of *Calliopsis* (*Perissander*) was also collected

near Villa Ahumada, Chihuahua. In general, collecting in the Chihuahuan desert was excellent due to record rainfalls for the season.

At Ciudad Jiménez the LaBerges and Nancy Pember returned to the United States and the remaining participants continued on to Reserva Biosfera, Mapimi, a remote site on the border of Durango and Chihuahua. This was undoubtedly the most successful collecting locality of the entire trip — more than 4000 specimens were collected over several days. At least one, and possibly three, new species of *Melanomada* were collected here, as well as *Calliopsis* (*Micronomadopsis*) *meliloti* and *Anthocopa daleae*, both previously un-recorded species from Mexico.

Alberto Burquez and Adrián Quijada returned to Hermosillo from Mapimi and the group continued south, reaching the southern-most extent of the trip, in the vicinity of Torreón and Zapata, on August 24. *Calliopsis* (*Micronomadopsis*) *callosa*, which had previously been known only from western Texas and southern Arizona/New Mexico, was collected at Zapata.

Returning northward, the group travelled to Ciudad Chihuahua, with a brief sortie eastward to Ojinaga, on the Rio Grande. A new species of *Stelis*, two new species of *Holcopasites*, and *Deltoptila* sp. were collected on this leg of the trip. We found excellent collecting at the Samalayuca sand dunes south of Ciudad Juarez. Due to abundant flowering of many plants we collected several thousand specimens of genera typical of the southwestern U.S., including a large matinal, *Oenothera*-visiting *Megachile* (*Megachiloides*) sp. Males and females of *Perdita* (*Macropteropsis*) *magniceps* were collected here; a species oligolectic on *Sphaeralcea* which had previously been known only from the male holotype.

After Samalayuca the group headed westward with the intent of taking the road from Nuevo Casas Grandes to Cuahtémoc, and on to Yécora. However, heavy rains had washed out the road to Cuahtémoc and we were forced to follow the highway south of the U.S./Mexico border, passing through Agua Prieta, and then west-southwest to Hermosillo. After spending the night of September 1 in Hermosillo, the group, rejoined by Alberto Búrquez, went southward to Alamos, near the southern border of Sonora. *Eulaema polychroma* was collected here, extending the northern-most record of this large genus of orchid bees. The group returned to Hermosillo on September 4 and most participants returned to their respective institutions on September 6.

In summary, the trip was a success. Roughly 17,300 bee specimens were netted during the 26 day, 6,177 km expedition. 148 herbarium specimens were also collected.

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Report on the second NSF-Funded PCAM expedition

By
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USDA Bee Biology and Systematics Laboratory,
Utah State University, UMC 53,
Logan, Utah 84322-5310

The second PCAM expedition to Mexico, supported by NSF grant BFR-9024723 with assistance from the Instituto de Biologia, UNAM, was conducted 28 October-13 November 1991 to explore the late fall fauna of parts of the Altiplano and coastal Veracruz with emphasis on the xeric areas of the Techuacan Desert, Puebla and Metztitlan Valley, Hidalgo — areas thought by some to be desert refugia during the Pleistocene. Participants for the entire expedition were Ricardo Ayala, Felipe Noguera, and Terry Griswold, with Alicia Rodriquez and Catalina Everaert joining for parts of the trip.

The expedition began in Mexico City, moved south and east to Tlayacapan, Taxco, and Ixtapan de la Sal, then southeast to Acatlan and Huajuapan de Leon, northeast through the Tehuacan Desert to Xalap, down to Cardel, then north along the coast to Poza Rica, inland to Pachuca, north through the Metztitlan Valley to Otango, and returned to Mexico City. The final two days were spent collecting in areas just south of the city and in natural area on the campus of UNAM.

The area sampled included parts of the states of Mexico, Morelos, Guerrero, Oxaca, Puebla, Veracruz, and Hidalgo, and the Distrito Federal. Parts of the route traveled are probably the most completely sampled of any region in Mexico. But collections during the summer months account for almost all of the sampling effort; very few bees have been collected during fall months. The results of this expedition prove that this is not due to the absence of a fall bee fauna. Over 4600 specimens were obtained during fifty collector-days. Bees were abundant in a wide variety of habitats including pine and oak forests, cloud forest, subtropical and tropical forests, and deserts. Except in a few areas, such as the coastal dunes of Veracruz, flowers were abundant. Some of the best collecting was on Asteraceae, Fabaceae, And *Salvia*.

Seventy-seven genera of bees were collected. Abundant groups included *Andrena*, Panurginae, Megachilidae, Eucerini, and *Bombus*. Surprisingly, Colletidae and Halictini were very poorly represented. Notable finds include the following: 1) Numerous specimens of the rare anathophorid *Deltoptila*; 2) The first records of *Dufourea* south of Zacatecas, *D. cyanella* from Morelos and Guerrero and an undescribed species from Puebla; 3) A new species of *Hesperapis* from the Tehuacan Desert; 4) A nesting site of the rarely collected *Mesoxaea tachytiformis*; 5) Seven

species of *Lasioglossum*, two of them apparently new; 6) Several new species of *Protandrena*; 6) Good series of *Trachusa* (*Ulanthidium*) and *T.* (*Heteranthidium*); 7) A new species of *Megachile* (*Chelostomoides*) from Ixtapan de la Sal, Mexico; 8) A new species of *Osmia* (*Diceratosmia*); 9) An undescribed species of *Hoplitis* (*Eremosmia*) from the desert area of Metztitlan Valley; 10) An undescribed osmiine of questionable generic assignment near *Hoplitis* or *Asmeadiella*, also from the Metztitlan Valley; 11) The previously undescribed female of *Nomada* (*Pachynomada*) *dreisbachorum*; 12) An undescribed nomadine belonging to the *Melanomada* complex; and 13) A new species of *Syntrichalonia*. Of interest was the relatively large number of specimens with bent hairs on the clypeus and/or frons of the female. These included *Caupolicana* (*Zikanapis*) *clypeata*, three species of *Lasioglossum*, *Osmia* (*Diceratosmia*) n.sp., *Anthidium*, *Trachusa* (*Utanthidium*), *Megachile* (*Chelostomoides*) n.sp., *Exomalopsis binotata*, *Pectinapis*, *Deltoptila*, and *Habropoda* aff. *salviarum*. Almost all these species were collected on *Salvia*.

A further expedition at this season or even later should be profitable. Flowers at many of the sites did not appear to be past their peak. Most of the specimens collected were in good condition, with the possibility of additional species later in the year. Areas which were poorly sampled due to weather or simply the time constraints of the trip included the road between Ixtapan de la Sal and Chalma, the road between Tehuacan and Orizaba, the eastern slopes of Perote and Citlaltepetl, the road from Poza Rica to Tulancingo, and the Metztitlan Valley. Areas where flowering was mostly past which should be sampled in September include the road between Izucar de Matamoros and Huajuapan, the Tehuacan Desert, xeric areas of Puebla around Perote, the coastal dunes of Veracruz, and the road between Tulancingo and Pachuca.

March PCAM Trip to Coahuila

By
Robert Brooks and Byron Alexander
Snow Entomological Museum, University of Kansas,
Lawrence, KS 66045

The next collecting trip in the faunal survey of Mexican bees (PCAM) will take place from 13 March to 3 April. Robert Brooks and Byron Alexander (University of Kansas) are in charge of arrangements in the U.S., whereas Ricardo Ayala (Estacion de Biologia, Universidad Autonoma de México, Chamela) will be handling arrangements in Mexico. Jack Neff (Central Texas Melittological Institute) will be accompanying us as a combined bee specialist and botanist, along with Luis Godínez (UNAM) and Doug Yanega (University of Kansas). We plan to take a single vehicle, the VW van recently purchased with grant funds.

Our goal primary goal is to survey the inland "Coahuila Chaparral," a habitat with a restricted, patchy distribution in northern Mexico. Chaparral is one of the ecological zones that the grant specifically targets and so most of the time will be spent visiting the various Sierras of this region, that range up to 2200 m in elevation. With these objectives in mind, we are planning to spend most of the three-week trip in the state of Coahuila, primarily north of Cuatro Cienegas.

Participants will gather in Torreon, and then travel northward to the Reserva Biosfera in Mapimi, a rich collecting site visited on previous PCAM expeditions. From there we will go further north to Sierra La Madera, just west of Cuatro Cienegas, and on to Ocampo, where we will leave the pavement and will try and reach Sierra El Fuste, Sierra San Ambrosio, Sierra El Palomino, Sierra Mojada, Sierra El Colorado and Sierra La Encantada.

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RESEARCH NEWS

A Revised Checklist of Polish Colletidae and Halictidae

By
Tadeusz Pawlikowski
Copernicus University,
Torun, Poland

During the last 15 years of my investigations on the Polish Apoidea, I have made many local lists of bees collected in Poland over the last century (see Melissa 2: 12-13).

The status of the generic categories are as in Michener C.D. (1944, Bull. Amer. Mus. Nat. Hist. 82: 151-326; 1964, Amer. Zool. 4: 227-239). However the species are in alphabetical order within each genus. The species records are divided into two date classes: pre-1950 (+), and 1950 to the present (*).

A list containing 34 species of Colletidae and 101 species of Halictidae from Poland is presented below.

COLLETIDAE

Hylaeus Fabricius, 1793
= *Prosopis* Fabricius, 1804
* *angustatus* (Schenck, 1859)
* *annularis* (Kirby, 1802)
= *cervicornis* (Costa, 1858)
= *dilatata* (Kirby, 1802)
* *annulatus* (Linnaeus, 1758)
= *borealis* Nylander, 1852
\+ *bisinuatus* Förster, 1871
= *leptocephala* (Morawitz, 1871)
* *brevicornis* Nylander, 1852
* *clypearis* (Schenck, 1853)
* *communis* Nylander, 1852
* *confusus* Nylander, 1852

= *gibba confusus* Nylander
sq. Warncke, 1972
+ *comutus* Curtis, 1831
* *diffomis* (Eversmann, 1852)
+ *gibbus* Saunders, 1850
= *genalis* Thompson, 1872
= *mixta* (Schenck, 1859)
* *gracilicornis* (Morawitz, 1867)
* *hyalinatus* Smith, 1842
* *nigritus* (Fabricius, 1798)
* *pectoralis* Förster, 1871
= *kriechbaumeri* Förster, 1871
= *palustris* Perkins auct.
* *pictipes* Nylander, 1852
* *punctatus* (Brullé, 1832)
* *punctulatissimus* Smith, 1842
+ *rinki* (Gorski, 1852)
* *signatus* (Panzer, 1798)
= *pratensis* Geoffroy auct.
* *sinuatus* (Schenck, 1853)
= *minutus* (Fabricius, 1793)?
* *styriacus* Förster, 1871
+ *variegatus* (Fabricius, 1798)

Colletes Latreille, 1802
* *caspicus balticus* Alfken, 1912
* *cunicularius* (Linnaeus, 1761)
* *daviesanus* Smith, 1846
= *inexpectatus* Noskiewicz, 1936
* *floralis* Eversmann, 1852
= *montanus* Morawitz, 1876
* *fodiens* (Fourcroy, 1785)
* *impunctatus* Nylander, 1852
= *alpinus* Morawitz, 1872
* *marginatus* Smith, 1846
* *nasutus* Smith, 1853
* *punctatus* Mocsary, 1877
* *similis* Schenck, 1853
= *picistigma* Thomson, 1872
* *succinctus* (Linnaeus, 1758)

HALICTIDAE

Halictus Robertson, 1918
* *confusus perkinsi* Blüthgen, 1926
* *eurygnathus* Blüthgen, 1931
* *leucaheneus arenosus* Ebmer, 1976
= *fasciatus* auct. nec Nylander, 1848
* *maculatus* Smith, 1848
* *quadricinctus* (Fabricius, 1776)
* *rubicundus* (Christ, 1791)
* *semitectus* Morawitz, 1873
* *sexcinctus* (Fabricius, 1793)
* *simplex* Blüthgen, 1923
* *subauratus* (Rossi, 1792)
* *tetrazonius* (Klug, 1817)
* *tumulorum* (Linnaeus, 1758)
= *fasciatus* Nylander,1848

Lasioglossum Curtis, 1833
* *aeratum* (Kirby, 1802)
= *viridiaeneum* (Blüthgen, 1918)
* *albipes* (Fabricius, 1781)
* *bavaricum* (Blüthgen, 1930)
* *brevicorne* (Schenck, 1868)
+ *breviventre* (Schenck, 1853)
* *calceatum* (Scopoli, 1763)
= *cylindricum* (Fabricius, 1763)
* *convexiusculum* (Schenck, 1853)
* *costulatum* (Kriechbaumer, 1873)
+ *cupromicans* (Pérez, 1903)
* *euboeense* (Strand, 1909)
* *fratellum* (Pérez, 1903)
= *niger* (Viereck, 1903)
* *fulvicorne* (Kirby, 1802)
* *glabriusculum* (Morawitz, 1872)
* *intermedium* (Schenck, 1868)
* *interruptum* (Panzer, 1798)
* *laeve* (Kirby, 1802)
* *laevigatum* (Kirby, 1802)
* *laterale* (Brullé, 1832)
* *laticeps* (Schenck, 1868)
= *mendax* (Alfken, 1912)
* *lativentre* (Schenck, 1853)
* *leucopum* (Kirby, 1802)
* *leucozonium* (Schranck, 1781)
* *limbellum* (Morawitz, 1876)
* *lineare* (Schenck, 1868)
* *lucidulum* (Schenck, 1861)
* *major* (Nylander, 1852)
* *malachurum* (Kirby, 1802)
= *longulum* (Smith, 1848)
* *minutissimum* (Kirby, 1802)
* *minutulum* (Schenck, 1853)
* *morio* (Fabricius, 1793)
* *nigripes* (Lepeletier, 1841)
* *nitidiusculum* (Kirby, 1802)
* *nitidulum aeneidorsum* (Alfken, 1921)
* *nitidulum nitidulum* (Fabricius, 1804)
= *continentale* (Blüthgen, 1944)
= *smeathmanellus* auct. nec Kirby, 1802
* *parvulum* (Schenck, 1853)
= *minutum* (Kirby, 1802) nec (Fabricius, 1798)
* *pauxillum* (Schenck, 1853)
* *politum* (Schenck, 1853)
= *nanulum* (Schenck, 1853)
* *prasinum haemorrhoidale* (Schenck, 1853)
* *punctatissimum* (Schenck, 1853)
+ *puncticolle* (Morawitz, 1872)
+ *pygmaeum* (Schenck, 1853)
* *quadrinotatulum* (Schenck, 1861)
* *quadrinotatum* (Kirby, 1802)
* *quadrisignatum* (Schenck, 1853)
* *rufitarse* (Zetterstedt, 1838)
* *semilucens* (Alfken, 1914)
* *setulellum* (Strand, 1909)
* *setulosum* (Strand, 1909)
+ *sexmaculatum* (Schenck, 1853)
* *sexnotatulum* (Nylander, 1852)
* *sexnotatum* (Kirby, 1802)
= *nitidum* Panzer, 1798
* *sexstrigatum* (Schenck, 1868)
* *subfasciatum* (Imhoff, 1832)
= *rufocinctum* (Nylander, 1852)
* *tarsatum* (Schenck, 1868)
* *tricinctum* (Schenck, 1874)
* *villosulum* (Kirby, 1802)
* *xanthopum* (Kirby, 1802)
* *zonulum* (Smith, 1848)

Sphecodes Latreille, 1804
* *albilabris* (Fabricius, 1793)
= *fuscipennis* (Germar, 1819)
* *crassus* Thomson, 1870
= *variegatus* Hagens, 1882
* *cristatus* Hagens, 1882

* *croaticus* Meyer, 1922
* *ephippius* (Linneaus, 1767)
= *divisus* (Kirby, 1802)
= *rufescens* (Geoffroy in Fourcroy, 1785)
= *similis* Wesmael, 1865
* *fasciatus* Hagens, 1882
= *affinis* Hagens, 1882
* *ferruginatus* Hagens, 1882
* *gibbus* (Linnaeus, 1758)
* *hyalinatus* Hagens, 1882
* *longulus* Hagens, 1882
* *marginatus* Hagens, 1882
* *miniatus* Hagens, 1882
* *monilicornis* (Kirby, 1802)
= *subquadratus* Smith, 1845
* *niger* Hagens, 1874
* *pellucidus* Smith, 1845
= *pilifrons* Thomson, 1870
* *puncticeps* Thomson, 1870
* *reticulatus* Thomson, 1870
\+ *rubicundus* Hagens, 1875
* *rufiventris* (Panzer, 1798)
= *subovalis* Schenck, 1853
\+ *scabricollis* Wesmael, 1865
\+ *spinulosus* Hagens, 1875

Nomioides Schenck, 1866
* *minutissimus* (Rossi, 1790)

Dufourea Lepeletier, 1841
= *Halictoides* Nylander, 1848
* *dentiventris* (Nylander, 1848)
\+ *halictula* (Nylander, 1848)
* *inermis* (Nylander, 1848)
* *vulgaris* (Nylander, 1859)

Rophites Spinola, 1808
= *Rhophitoides* Schenck, 1859
* *canus* Eversmann, 1852
* *hartmani* Friese, 1902
* *quinquespinosus* Spinola, 1808
\+ *trispinosus* Pérez, 1903

Systropha Illiger, 1806
* *curvicornis* (Scopoli, 1770)
* *planidens* Giraud, 1861

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Research at Tel-Aviv University

Dan Eisikowitch wanted to share with us some of the work going on at the Tel-Aviv University in Israel.

"Our labs are collaborating on a joint project on the intimate relations between *Calotropis procera*, a species of Asclepiadaceae, and the bees on which it depends for pollination, *Xylocopa pubescens* and *X. sulcatipes*.

"This research is supported by the Israeli Academy of Science and its main target is to elucidate the way in which the plant attracts the bees, information about what the bees leave on the flowers and how other bees can evaluate it.

"We shall appreciate comment from anyone interested in such interrelationships."

A recent work includes: *Calotropis procera* and Carpenter Bees; a study of interrelationships. By D. Eisikowitch and A. Hefetz. Department of Botany and Zoology , Tel-Aviv University, Tel-Aviv, Israel.

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Sex Determination in Early Instar Bee Larvae

We wish to bring to the attention of Melissa readers a recent paper describing very simple staining methods for determining the sex of bee larvae at any stage of development, from first instar to pre-pupa. M.J. Duchateau and P. Van Leeuwen (1990, Insectes Sociaux, 37:232-235) describe their use of the method to determine the sex of bumble bee larvae but speculate the method may work on other bees (and presumably wasps) as well.

The method relies on first fixing the larvae in Carnoy's fixative and then using Congo Red to stain the imaginal disks of the genitalia, which differ strikingly in morphology between males and females. The method works very well with *Perdita* last instar larvae, even when the staining step is eliminated. We thank Hayo H.W. Velthuis and George Eickwort for pointing this article out to us.

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Phenology of two territorial solitary bees, *Anthidium manicatum* and *A. florentinum* (Hymenoptera: Megachilidae)

By
Peter Wirtz

Five years' data on phenology of an *Anthidium manicatum* population in Southern Germany and comparative observations on *A. manicatum* and *A. florentinum* from Southern France are analyzed. Males and females had the same flight season, adult sex ratio was strongly female biased and males were larger than females in both species. This is the opposite pattern to most other solitary bees, where females are generally larger than males, sex ratio is male-biased, males emerge before females and males disappear long before females. We argue that two features of *Anthidium* female behaviour, namely prolonged sexual receptivity and use of resources easily defendable by males, explain male adaptations in behaviour, phenology, and body size and, hence population sex ratio. (Full article to be published in Journal of Zoology.)

MEETING ANNOUNCEMENTS

Fifth International Conference on Apiculture in Tropical Climates

September 7 - 12 1992.

Organized by The International Bee Research and Association and The Government of Trinidad and Tobago. The purpose of this meeting is to focus attention on the bees and beekeeping of the tropics and subtropics. For more information please send your name and address to: Nicola Bradbear, Fifth International Conference on Apiculture in Tropical Climates, International Bee Research Association, 18 North Road, Cardiff, CF1 3DY, UK.

International Workshop on Non-*Apis* Bees

August 10-13, 1992

USDA-ARS Bee Biology & Systematics Laboratory
Utah State University
Logan, Utah 84322-5310
Second Announcement and Call for Papers

Monday - August 10

The Biology and Management of the Alfalfa Leafcutting Bee

Moderators: W.P.Stephen, Oregon State University, Corvallis
K.W. Richards, Agriculture Canada, Lethbridge

Tuesday - August 11

Bumblebees as Crop Pollinators

Moderator: R.M. Fisher, Acadia University, Wolfville

Non-Social Bees as Crop Pollinators

Moderator: S.W.T. Batra, USDA ARS, Beltsville

Wednesday - August 12

Foraging and Nesting Behavior of Non-*Apis* Bees

Moderator: P.G. Willmer, University of St. Andrews, Fife

Bee-Plant Interactions

Moderator: A. Shmida, Hebrew University, Jerusalem

Thursday - August 13

Interactions Between Bees and Their Parasites

Moderator: To be announced

Biosystematics, Biogeography and Evolution of Bees

Moderator: C.D. Michener, University of Kansas, Lawrence

Contact: Vincent J. Tepedino (801) 750-2559
Philip F. Torchio (801) 750-2520

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MARGINALIA

Chris Starr sent us this item from *Folk Tales of Meghalaya and Arunchal* (1974, Pradesh, New Delhi: Sterling, 112 pp.) by B.K. Borgohain.

How Bees Came Into the World

The god named Limir-Chabbo looked like a bison. At the time when the sun and moon shed light on the earth in the beginning, Limir-Chabbo roamed about in the mountains. While he was thus roaming about his dropping turned into bees and those bees drank up his urine and so they did not leave the place. Then another god named Dalling picked up the bees and put them on a tree. But they slipped down from the tree. Then the god fixed the hive on the tree by tying it with his loin cloth. The bees built their nest sitting up on the hive and produced honey. The honey is sweet. Because it is god's urine.

CORRECTIONS

In the Recent Literature list included with Melissa 4, two papers, Gonzalez, J.M., 1989 and Gonzalez, J.M., 1990 were given single authorship. They were both co-authored and should have read Gonzalez, J.M. and Gainai, M.A.

The second edition of ***Bumblebees*** by Oliver Prys-Jones and Sarah Corbet, has been published by the Richmond Publishing Co. Anyone interested in ordering this book should write to the following address: **Richmond Publishing Co. Limited, P.O. Box 963, Slough SL2 3RS, England.** (ISBN: 0.8356 2574 [paperback]; 0.83546 2582 [hardcover])

Books of interest:

Kin Recognition. Peter G. Hepper, ed. Cambridge University Press, New York, 1991. See the review in Science 255:217.

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Recent Apoid Literature: 1987-1991

The following list of references has been compiled primarily from the National Agricultural Library's computer-based bibliographic retrieval system, as well as from reprints or lists of papers kindly sent to us by subscribers. Papers dealing specifically with the commercial aspects of *Apis mellifera* or *Megachile rotundata* have not been included, but papers of general biological interest have been included. Key words included most bee genera, familial and subfamilial names as well as pollination biology and bee/plant interactions. We admit in advance that these citations have not been checked for accuracy.

At present the roughly 500 references shown below are included in a single file created by v. 1.4 of the bibliographic software package Pro-Cite (Address: P.O. Box 4250, Ann Arbor, Michigan, 48106; 313-996-1580). The entire bibliography contains over 1300 references in two files. We would like to make this and expanded lists available to other Pro-Cite users, or users of other, compatible, bibliographic programs. We hope in the future to send out the complete bibliography on disk to readers who agree to add references or check those already input. Additionally, it is planned to supplement this list with references gathered from Biological Abstracts or Zoological Record, which should extend the list back to the late 1970's.

As a preliminary step towards making this reference list available to *Melissa* readers on disk, we would be willing to send copies of the full bibliography in the form of a WordPerfect 5.0 text file to anyone who sends us a request and a blank 3.5 or 5.25 inch diskette.

Please send us comments on the utility of the reference list and how we might make it more generally available to researchers. And please continue to send reprints and reference lists to Ronald McGinley for inclusion in upcoming lists.

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