

**New Species, Synonymy and Lectotype Designations in  
North American Bembicini**  
(Hymenoptera: Sphecidae)

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During a survey of the bembicid fauna of California, several new species have come to light and these are described below. Holotypes are in the Museum at Davis and in the California Academy of Sciences. The opportunity is taken also to establish lectotypes and point out synonymy for some North American Bembicini. Remarks on the Handlirsch types were made possible through the kindness of Dr. Claude Besuchet of the Museum d'Histoire Naturelle in Geneva, Switzerland; and by Dr. Max Fischer of the Natural History Museum in Vienna, Austria.

***Bembix frommeri* R. Bohart, new species**

MALE HOLOTYPE.—Length 17 mm. Black, marked with whitish and pale yellow; principal whitish areas on mandibles, clypeus, foretibia, foretarsus, scutellum, metanotum and tergites. Pale markings: face except mandible tip, quadrate frontal spot, and band across vertex connected with back of head; scape and flagellum beneath; outer orbital stripe widened toward mandible; pronotum; pleuron except for spots on mesopleuron; scutum laterally and 2 small discal stripes anteriorly; posterior scutellar band and metanotum; posterior half of propodeal enclosure followed by black band, then practically all yellow; legs mostly, but with black stripes behind femora and small spots on tibiae; broad apical tergal bands anteriorly tri-emarginate, 3 separate spots on V, double median spot on VI and apical half of VII; sternite I except for 2 black spots, II medially and basolaterally, III–V with lateral spots, VII–VIII apically. Wings clear, veins mostly brown. Pubescence mostly pale, rather long and shaggy on head.

Labrum a little shorter than eye height, slightly humped at basal third in profile; mandible with strong denticle, scape two-thirds as long as clypeus, midocellus a narrow but translucent lunule, flagellum with shiny tyloides beneath articles II and following, last article with welt-like tylus on basal half; front basitarsus with 8 rake setae; midtibia irregular beneath and with few minute denticles toward apex; first intersubmarginal vein of forewing nearly straight; tergite VII longitudinally wrinkled, distinctly angled out basolaterally, spiracular lobe slender and reaching only as far as basolateral angle; sternites II and VI without carinae or projections; gonostyle tapering gradually toward apex, covered with rather fine hair; digitus slender, widening gradually to truncate and slightly emarginate apex; cuspis slender, finger-like.

*Holotype male* (CAS), 5 MI. SOUTH OF DEEP SPRINGS COLLEGE, INYO COUNTY, CALIFORNIA, 11 July 1967 (Saul and Suzy Frommer).

Paratype male, Wyman Canyon, Inyo Co., California, 25 June 1966 (Saul and Suzy Frommer, UCR).

A close relationship is indicated with *B. dentilabris* Handlirsch in which the male also has an irregular clypeal profile, nearly straight first intersubmarginal vein, wrinkled and basally angled tergite VII, and simple sternites II and VI. The 2 species differ in markings, *B. dentilabris* being yellow and having a u-shaped scutal mark. In *B. frommeri* the markings are extensively whitish and the scutum is nearly all dark discally. More significant are a few structural characters. In *B. frommeri* the tylus beneath the last flagellomere is a shiny welt but is confined to the basal half rather than tapering toward the apex of the article. Also, the midfemur is sparingly spiculate beneath. The genitalia show critical differences. In *B. frommeri* the gonostyle is large, conical and finely haired, rather than ligulate and spinose apically. Furthermore, the cuspis is narrowly finger-like rather than blade-like.

The species is named for Saul Frommer who has made many interesting collections of bembicids in California.

#### ***Microbembex californica* R. Bohart, new species**

MALE HOLOTYPE.—Length 11 mm. Black, extensively marked with yellow as follows: lateral strip on labrum, pronotal band all across, lateral spot over wing base, lateral third of scutellum, metanotum, broad band across propodeum, lateral propodeal angles, irregular upper mesopleural spot, legs partly, foretibia basally and posteriorly, midtibia except ventrally, hindtibia entirely, fore basitarsus posteriorly, mid and hind tarsi mostly, tergites except narrow basal bands and 2 black dots at summit of I, arcuate band across sternite II, lateral spots on III–IV. Wings lightly stained, veins light brown to black, basal half of forewing costa pale, veins of first submarginal cell brown except narrowly at base. Pubescence short, pale, mostly inconspicuous; moderately silvery on face, long and erect on frons and propodeal angles. Punctuation close, scutum and mesopleuron with punctures separated by 1 diameter or less. Last 7 flagellar articles polished beneath; fore basitarsus 3 times as long as broad; hindfemur regular in outline; median projection of sternite II moderately large, keel-like, outline rounded at summit, then nearly flat to an acute posterior point; tergite VII incised apically, incision about half as broad as length of third hindtarsal article; sternite VIII curving gently, bluntly spear-shaped. Digitus with broadly rounded apical part not projecting backwards.

FEMALE.—Length 8 to 13 mm. Black, marked with white or occasionally pale yellow as follows: mandible and clypeus partly, labrum laterally or mostly, outer orbits narrowly, pronotum laterally, rest of notum sparingly, spot on upper mesopleuron usually, legs as in male, moderately narrow tergal bands on I–V, lateral spots on sternites II–III. Wings as in male but usually darker. Pubescence as in male except on mesopleuron where appressed silvery hair partially obscures punctuation. Tergite VI narrowly and sharply emarginate at apex.

*Holotype male* (UCD), DAVIS, YOLO COUNTY, CALIFORNIA, 5 August 1964, in dry sand creekbed (R. M. Bohart). Paratypes, 29 males, 62 females (all from central California): Davis, Sacramento, and Antioch. Paratype dates are May to September. Additional specimens have been examined from many other localities in California, and from other western states east to Wyoming (Sweetwater Co.), Utah (Cornish), and New Mexico (Embudo). It occurs also in Baja California Del Norte, Mexico.

The species has previously been confused with *M. monodonta* (Say) which occurs east of the Continental Divide. Females seem to be indistinguishable but males of *M. californica* have the antenna shiny beneath toward the apex rather than dull, the sternal keel nearly always with a sloping flat top rather than evenly rounded, and the digitus with the broadly rounded apical part not projecting backwards.

### ***Microbembex argyropleura* R. Bohart, new species**

MALE HOLOTYPE.—Length 10 mm. Black, extensively marked with light yellow as follows: pronotal band all across, broad lateral scutal stripe, pair of discal scutal dots, scutellum and metanotum mostly, band across summit and other small dots on propodeum; legs partly and especially on hindleg, tergites mostly, and lateral dots on sternites II–III. Abdominal venter mostly reddish brown; wing membrane clear, costa mostly and most other veins basally white; first submarginal cell with radius white and other veins yellowish to light brown. Pubescence silvery, moderately prominent on propodeum, mesopleuron, scutum and frons. Punctuation close, scutum and mesopleuron with punctures separated by 1 diameter or less. Last 4 flagellar articles rather dull beneath, not polished; fore basitarsus 4 times as long as broad; hindfemur regular in outline; median projection of sternite II small, acute, keel-like, evenly curved; tergite VII incised apically, incision about half as broad as length of third hindtarsal article; sternite VIII curving gently, bluntly spear-shaped. Digitus with bluntly rounded apical part not projecting backwards.

FEMALE.—Length 9 to 12 mm. Black, marked with whitish yellow as follows: mandible, labrum and clypeus mostly, thin lines along inner and outer orbits, scape partly, thorax about as in male but scutum usually dark discally, tergites with broad bands which are edged basally with dark brown or reddish brown, tergite VI banded or with 2 spots, sternites with small lateral spots on II–IV or II–V imposed on reddish brown background. Wings as in male. Silvery pubescence forming dense coat on mesopleuron, scutum and frons. Tergite VI narrowly and sharply emarginate at apex.

*Holotype male* (UCD), 18 MI. WEST OF BLYTHE, RIVERSIDE COUNTY, CALIFORNIA, 16 October 1965 (R. M. Bohart). Paratypes, 43 males, 37 females (all from southern California): near Blythe, Borrego Valley (San Diego Co.) Cronise Valley (San Bernardino Co.), Palo Verde (Imperial Co.) and 13 mi. east of Ocotillo Wells (Imperial Co.).

Paratype dates are April to October. I have seen material also from California (Heber, 1000 Palms Oasis, Palm Springs, Olancho, Antelope Springs in Inyo Co.), Arizona (Yuma, Toltec, Eloy, Grand Canyon floor, Willow Ranch in Mojave Co.), Nevada (Nixon, Pyramid Lake, Wadsworth), Utah (12 mi. south of Eureka), and Baja California, Mexico (28 mi. south of El Arco).

The species has previously been confused with *M. hirsuta* J. Parker which occurs in New Mexico and Texas. I am unable to separate females of the 2 species but males offer no problems. In *M. argyropleura* males the sternites have short and rather inconspicuous pubescence, whereas in *M. hirsuta* there is a dense erect pile which extends in gradually increasing length from the sternal keel onto sternite VII. A superficial resemblance exists between males of *M. argyropleura* and *M. californica*. The white radius on the first submarginal cell and the narrower fore basitarsus of *M. argyropleura* are distinguishing. The silvery mesopleural mat of female *M. argyropleura* is distinctive among Californian species.

Variation in color pattern occurs as would be expected. However, the face of the male is always entirely black, contrary to the case in *M. californica*. The scutum is usually black discally, the scutellum and propodeum may each have 2 large spots rather than bands, and the abdominal ground color varies from nearly black to brownish red, especially in females.

### ***Microbembex rufiventris* R. Bohart, new species**

MALE HOLOTYPE.—Length 13 mm. Black, extensively marked with yellow as follows: pronotal lobes, spot over wing base, large scutellar spots, metanotal band and one across summit of propodeum, legs partly but foreleg nearly all black, tergites mostly, small lateral spots on sternites II–V; ground color of sternites reddish brown. Wings nearly clear, forewing costa pale to stigma, veins of first submarginal cell brown, a little yellowish at base of cell. Pubescence short, pale, mostly inconspicuous; moderately silvery on face, long and erect on frons and propodeal angles. Punctuation close, scutum and mesopleuron with punctures separated by 1 diameter or less. Last 4 flagellar articles not polished beneath; fore basitarsus 3.5 times as long as broad; hindfemur regular in outline; median projection of sternite II a raised carina, sharp posteriorly; tergite VII shallowly emarginate apically, incision about as broad as length of third hindtarsal article; sternite VIII curving gently, bluntly spear-shaped. Digitus stout, broadly rounded apical part not projecting backwards.

FEMALE.—Length 9 to 13 mm. Black, marked with greyish white as follows: labrum and mandibles mostly, clypeus broadly, scape partly, narrow orbital streaks, pronotal lobes, spot over wing base, metanotal spots, legs partly, narrow apical tergal bands, broadened laterally, lateral dots on pygidium; sternites as in male but redder; ground color of tergites mottled with reddish. Wings as in male

but a little darker. Punctuation and pubescence as in male. Tergite VI narrowly and sharply emarginate at apex.

*Holotype male* (UCD), COALINGA, FRESNO COUNTY, CALIFORNIA, 22 May 1936 (R. M. and G. E. Bohart). Paratypes, 1 male and 2 females, same data as type; 1 male, Cawelo Junction, east of Shafter, Kern Co., California, 24 July 1952 (T. R. Haig, UCD).

There is considerable resemblance to darker forms of *M. californica*. However, the male of *M. rufiventris* has the undersurfaces of the last 4 flagellomeres rather dull, the sternal keel cariniform, and tergite VII much broader at the apex. The female has dorsal markings greatly reduced. In the few females of *M. californica* which approach this condition the face is extensively dark in contrast to *M. rufiventris*. It remains to be seen whether this difference in the females will hold up when more specimens of *M. rufiventris* are collected.

#### Genus BEMBIX

*Bembix amoena* Handlirsch, 1893. The lectotype male here designated is in the Vienna Museum, "Nevada."

#### Genus BICYRTES

*Bicyrtes annulata* J. Parker, 1917. The holotype female is in the collection of the University of Kansas at Lawrence, "Oak Creek Canon, Ariz. 6000 ft." This is a synonym of *B. capnoptera* (Handlirsch), 1889. It represents the more yellowish western variety.

*Bembidula capnoptera* Handlirsch, 1889. The lectotype female here designated is in the Vienna Museum, "Kentucky."

*Bembidula capnoptera mesillensis* Cockerell, 1898. The holotype male is in the U. S. National Museum, "Las Cruces, N.M." It is a synonym of *Bicyrtes capnoptera* (Handlirsch), 1889.

*Bembidula diodonta* Handlirsch, 1889. The holotype is a male in the Geneva Museum, "Mexiq. Orizaba." This is a distinctive species of *Bicyrtes* related to *B. discisa* (Taschenberg) but with serrate midfemur, broader foretarsus and dentate sixth sternite.

*Bembidula fodiens* Handlirsch, 1889. The lectotype male here designated is in the Vienna Museum, "Dallas, Texas."

*Bicyrtes gracilis* J. Parker, 1917. The holotype male is in the collection of the University of Kansas, Lawrence, "Santa Rita Mts., Ariz., 5-8000 ft." This is a synonym of *B. viduata* (Handlirsch), 1889.

*Bembidula insidiatrix* Handlirsch, 1889. The lectotype here designated is a female in the Vienna Museum, "Kentucky."

*Bembidula odontophora* Handlirsch, 1889. The lectotype here designated is a male in the Vienna Museum, Nauta, "E. Peru."

*Bicyrtes oribates* Pate, 1936. The holotype is a male in the Cornell University collection. "Compostela, Nayarit, Mexico." This is a synonym of *B. diodonta* (Handlirsch), 1889.

*Bicyrtes parata* Provancher, 1889. The holotype female is in the collection of Laval University, St. Foy, Quebec, "Los Angeles (Coquillett)." It is a synonym of *B. ventralis* (Say), 1824 and represents the more yellow western variety.

*Bicyrtes tristis* C. Fox, 1923. The holotype is a male bearing no data but presumably from La Paz, Baja California, in the California Academy of Sciences, San Francisco. It seems to be a rather dark specimen of *B. capnoptera* Handlirsch.

*Bembidula viduata* Handlirsch, 1889. The lectotype here designated is a female in the Geneva Museum, "Huastec," Mexico. This large *Bicyrtes* is fairly abundant in southwestern United States and northern Mexico.

#### Genus MICROBEMBEX

*Microbembex monodonta deltaensis* Johnson and Rohwer, 1908. The lectotype here designated is a male in the U. S. National Museum labeled "cotype" by Rohwer, "Delta, Col. 7 20 98." This is a synonym of *M. nigrifrons* (Provancher), 1889.

*Microbembex monodonta neomexicana* Johnson and Rohwer, 1908. The lectotype here designated is a female in the U. S. National Museum labeled "cotype" by Rohwer, "Las Cruces, N.M., flo. *Solidago*, Aug. 30 (Twins.)." This has rather shiny yellow spots on the scutum and is a synonym of *M. nigrifrons* (Provancher).

*Microbembex monodonta occidentalis* Johnson and Rohwer, 1908. The lectotype here designated is a female in the U. S. National Museum labeled "cotype" by Rohwer, "Paris Tx XI-26 1904, C. R. Jones collector." This is a synonym of *M. monodonta* (Say), 1824.

*Bembex nigrifrons* Provancher, 1889. The lectotype here designated is a female *Microbembex* in the collection of Laval University, St. Foy, Quebec, "Los Angeles (Coquillett)." It has a pair of rather shiny discal yellow spots on the scutum.

#### Genus STICTIELLA

*Monedula mammillata* Handlirsch, 1890. The lectotype here designated is a male in the Geneva Museum, "Georgie." It is a synonym of *Stictiella emarginata* (Cresson), 1865, as previously supposed.

*Monedula plana* W. Fox, 1895. The holotype is a male in the U. S.

National Museum, "Custer, South Dakota (Aldrich)." This is apparently a synonym of *Stictiella serrata* (Handlirsch), 1890, differing only in having the bands on tergites II–VI complete rather than narrowly broken medially.

*Monedula serrata* Handlirsch, 1890. The holotype is a male in the Geneva Museum, "Georgie." It is a rather abundantly yellow-marked *Stictiella* agreeing with previous interpretation.

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**Observations on the Behavior and Biology of *Microbembex californica* Bohart**  
(Hymenoptera: Sphecidae)

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During July 1969, observations were made on a colony of *Microbembex californica* R. Bohart in the dunes 5 miles south of Samoa, Humboldt County, California. *M. californica*, limited mostly to the Pacific coastal states, is a general scavenger, taking dead arthropods as "prey" for nest provisioning. Although no previous work dealing with *M. californica* has been recorded, the behavior and biology of the wasp is very similar to that of an eastern species, *Microbembex monodonta* (Say) described by Evans (1966) and Parker (1917).

The nesting site, approximately 6 × 15 meters, was located in a large blowout free of vegetation and surrounded by plants typical of the dune ecology: *Artemisia pycnocephala*, *Eriogonum latifolium*, and *Haplopappus racemosus*. The area was shared with three other species of wasps: *Bembix americana comata* Parker, *Oxybelus uniglumis quadrifasciatus* Say, and *Philanthus pacificus* Cresson.

The female, usually in the early afternoon, begins to dig at a series of sites, particularly in crusted sand, before choosing the true nest site. A few females may begin digging in uncrusted sand and may spend more than an hour digging. The digging action of the female resembles that of a teeter-totter. Balanced on her middle legs, the female bobs her head down, scrapes sand loose and kicks it out behind her. After several scuffs, she bobs back to a normal position and continues to bob up and down until she has started the burrow. Every few minutes she