A Sex Association in the Genus *Brachycistis*

(Hymenoptera: Tiphiidae)

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It seems surprising that in a group of wasps as conspicuous and abundant over the western half of the United States as Brachycisitidinae, the sexes have not been associated or even placed in the same subfamily until quite recently (Mickel and Krombein, 1942). Sexual dimorphism is so pronounced in the subfamily that a dual system of nomenclature has evolved with the males in one series of genera and species and the females in another. Of the 60 species currently recognized in America north of Mexico, the sexes have been definitely associated for only two (Wasbauer, 1968).

The purpose of this paper is to present a third sex association in the genus *Brachycistis* and to provide a description of the previously unknown female.

I recently had the opportunity to examine a collection made at Winchester, Riverside County, California, by Mr. W. R. Icenogle. Mr. Icenogle has deployed pit traps at various times on his property and in conjunction with these has operated a fluorescent blacklight. The Winchester locality is in a coastal sage scrub association and is depauperate in brachycistidines. Over a three-year period, the fluorescent blacklight attracted a total of two species of males, *Brachycistis agama* Dalla Torre and *Brachycistis carinata* Fox. The pit traps collected two species of females, *Brachycistis agama* and a new species referable to the genus *Astigmometopa* Mickel and Krombein. It seems certain that the Winchester *Astigmometopa* is the female of *Brachycistis carinata*. The rationale for this association is as follows:

1. Over a three-year period, two species based on males and two based on females have been taken at the Winchester locality.
2. In one of the species, *Brachycistis agama*, the sexes have already been associated.
3. The *Astigmometopa* is of the same integumental color as *Brachycistis carinata* from Winchester and bears the same size relationship to it as previously associated females to their males.

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4. *Brachycistis carinata* is very restricted in its distribution, occurring only in the Southern California Coastal Mountains. In collections of brachycistidine females I have examined from numerous California localities, I have not seen this species previously.

Admittedly, point four above is weak, since female brachycistidines are still uncommon in collections, and it might be argued that the Winchester female referable to *Astigmometopa* could occur elsewhere but simply has not been taken previously. However, it seems more likely that if it were the female of a more widely distributed species, representatives would have appeared in some of the collections examined.

On the basis of these considerations, I propose the following nomenclatorial action:

Brachycistis Fox, 1893: 7, male.
Astigmometopa Mickel and Krombein, 1942: 668, female (new synonymy).

The type species of *Astigmometopa* is *A. emarginata* Mickel and Krombein 1942: 668 [= *Brachycistis emarginata* (Mickel and Krombein)] (new combination) described from Valentine, Texas. Mickel and Krombein state that males referable to *Brachycistis alcanor* (Blake) (cited as *B. cremastogaster* Melander) were taken at the same time and place as the unique female type of *B. emarginata* and speculate that this species may be the male of *B. emarginata.* Of the males, the species morphologically most similar to *Brachycistis carinata* is *B. ioachinensis* Bradley. The range of the latter overlaps that of *B. alcanor* throughout Arizona, New Mexico, and western Texas, so it is at least equally likely that *B. ioachinensis* will prove to be the male of *B. emarginata.* In view of this uncertainty, I am retaining the name *Brachycistis emarginata* until a definite sex correlation can be demonstrated.

A plesiotype selected from the Winchester, California series of females is described below:

BRACHYCISTIS CARINATA FOX

PLESIALLOTYPE FEMALE.—Shining medium brown, moderately heavily punctate, punctures rather large and deep, scattered third degree density on head except for close set row along inner margin of compound eye extending posteriorly to intersect curved setose sulcus of vertex; scattered third degree density on disc of thoracic nota and sides of pronotum; first degree density on dorsolateral surfaces of pronotum, dorsolateral surfaces of propodeum, edge of expanded portion of mesepisternum and posterolateral surfaces of propodeum; single row of large, close set punctures on posterodorsal edge of propodeum; very small, first to second degree density on declivous posterior face of propodeum; larger second degree

density on proepisterna, each puncture giving rise to a long, straight, straw-colored hair; declivous anterior portion of first metasomal tergum shagreened with minute, close set punctures, posterior dorsal portion shining with scattered larger punctures; succeeding metasomal terga very sparsely punctate except for curved row of closely spaced punctures before apex of each.

Head.—Subquadrate, broader than long, width at widest point 1.2 times length (measured from vertex to apex of clypeus); vertexal impressions deep, noticeably curved, divergent posteriorly; curved setose genovertical sulci present, becoming series of disconnected punctures anteriorly, nearly straight row of contiguous to subcontiguous punctures posterior to each sulcus; compound eye removed from posterior margin of vertex by 1.9 times its length; mandibles slender dorsally, widest about middle at distinct mesal tooth, then gradually narrowed to acute apex; laterally with low ventral carina margined by lateral setose sulcus which extends apicad slightly beyond middle of mandible; antennae not flattened, scape densely setose dorsally and ventrally for its entire length, hairs at apex, dorsally forming loose tuft directed posteriorly; first four antennal segments in a ratio of 3.3:1.0: 1.3:1.4; clypeus in dorsal view a narrow transverse rectangle, lateral margins abruptly truncate, median portion slightly produced, medioapical margin feebly concave. Underside of head with occipital carina transverse anteriorly, forming nearly straight line across midline of head, integument transversely angled just anterior to it; maxillary palpi six segmented, labial palpi four segmented; gular orifice relatively short, 0.3 times as wide as head at level of mandibular insertions.

Mesosoma.—Width ratios of thoracic nota: pronotum 1.00; mesonotum 1.09; propodeum 0.88; propodeum trapezoidal, 0.66 times as wide at base as at apex; prothoracic leg short, tibia without spines on anterior surface, posterior surface glabrous with oblique row of three spines toward apex; basitarsus ventrally with two spines directed anteroventrally, basal spine nearly twice length of apical spine, posteriorly with two comb spines of equal length before apex and three at apex, the longest slightly shorter than basitarsus and longer than second tarsal segment, second segment with short spatulate spine on anterior edge basad of middle, pair of long comb spines on posterior edge at apex and pair of shorter spines dorsad and ventrad of comb spines; third segment with very small spine on anterior margin near base and pair of much shorter comb spines; penultimate segment with single very slender comb spine; mesotibia with four rows of stout spines on anterior surface, spines of dorsal row spatulate, six or seven in number; metatibia with three ill-defined spine rows.

Metasoma.—First metasomal segment without distinct petiole; pygidium shining, gently convex with small, shallow, paired sulci laterally before apex.

Length.—8.8 mm.

The plesiallotype bears a small printed label with the following data: "Winchester, Riverside Co. Cal. 8-June-68, W. Icenogle" and a small hand-printed label: "in pit trap." It has been placed in the collection of the California Academy of Sciences.

Through the kindness of Dr. G. W. Byers, Snow Entomological Museum, Lawrence, Kansas, the holotype of *Brachycistis emarginata* (Mickel and Krombein) has been made available to me for study. It differs from the plesiallotype and other specimens from Winchester of *B. cari-*

nata (Fox) in the configuration of the occipital carina; in *B. emarginata* the anterior ventral portion is somewhat angled at the midline of the head; in *B. carinata* the two sides form a nearly straight transverse line; in *B. emarginata* the integument of the head is not angled just anterior to the closure of the occipital carina anteriorly; in *B. carinata* there is a distinct angulation; in *B. emarginata* there is a curved row of large, well-separated punctures dorsolaterally on the vertex; in *B. carinata* there is a distinct, curved, setose genovertical sulcus; in *B. emarginata* vertexal impressions are absent; in *B. carinata* they are well-developed, elongate, and diverging posteriorly. This character is no doubt somewhat variable, however; I have seen a specimen from Walnut Canyon, near Flagstaff, Arizona, which fits *B. emarginata* in most respects but has small, dot-like vertexal impressions.

Literature Cited

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Wasbauer, M. S. 1968. Some sex associations in the Brachycistidinae. Pan-Pac. Entomol., 44: 297–299.

BOOK NOTICE

The Natural History of Mendocino. By Jacques R. Helfer. Published by the author. Frontispiece, [4+] 159 pp., about 400 un-numbered figs., 1 color pl. Spring, 1970. $15.00, postpaid from J. R. Helfer, Mendocino, Calif. 95460.

This is an attractively produced book for the nature lover, which definitely belongs in research and taxonomic libraries as well. Basically it is a series of illustrated descriptions of interesting natural history items to be found near Mendocino, on the coast of northern California, but many of the subjects occur widely throughout the state and beyond. It includes a key to the genera of California buprestid beetles with all genera figured, and illustrated notes on three exotic buprestids. For the entomologist there are drawings and descriptive comments (habits and habitats, life histories, etc.) on termites, earwigs, grasshoppers and allies, bugs, moths, wasps, flies, millipeds, spiders, and a pseudoscorpion. All drawings are by the author, and many are the first published illustrations of these California species. There are many figures of Coleoptera; some, with accompanying text, have appeared in the finely produced but little known (and now unfortunately defunct) local magazine, *The Mendocino Robin.* The book is written to interest and intrigue the inquiring mind, and makes a fine gift.—Hugh B. Leech, *California Academy of Sciences, San Francisco 94118.*

Wasbauer, Marius S. 1971. "A sex association in the genus Brachycistis (Hymenoptera: Tiphiidae)." *The Pan-Pacific entomologist* 47, 211–214.

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