

TWO NEW SPECIES OF AUSTRALIAN *BEMBIX* SAND WASPS, WITH NOTES ON OTHER SPECIES OF THE GENUS (HYMENOPTERA, SPHECIDAE)

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Abstract

Two new species of *Bembix* are described from Northern Territory: *gurindji* (Daly River) and *obiri* (near Mt. Cahill). The female of *B. kununurra* is described for the first time, and range extensions are given for three other species.

Introduction

In a recent review of the biosystematics of Australian *Bembix* sand wasps, 80 species were recognised (Evans and Matthews, 1973). Extensive collecting of these wasps during the summer of 1979-1980 tended to confirm the conclusions set forth in that review, but two new species were found in series in the collection of the Department of Primary Production, Darwin, the female of *B. kununurra* was collected for the first time, and three species were collected from well outside their previously known ranges. In the descriptions, the terminology of Evans and Matthews (1973) has been followed.

Bembix gurindji sp. n.

(Figs 1, 2, 4)

MALE

Morphology. Length 19.5 mm; fore wing 12.5 mm; wing index 1.82. Mandibles robust, moderately curved, index 2.0. Clypeus 2.0 x as wide as high, strongly protuberant and abruptly flattened on apical two-thirds, flattened area distinctly punctate. Front narrow, minimum width 0.53 x eye height, centre of vertex well below level of eye tops. Scape robust, twice as long as wide; third antennomere 2.7 x as long as wide; outer antennomeres strongly modified, as figured for *B. mareeba* (Evans and Matthews, 1973, fig. 118). Fore femur unmodified, 2.8 x as long as wide; fore tibia much broadened from base; fore basitarsus much expanded and shield-like, 1.6 x as long as maximum width, outer margin with a series of nine strong, black lobes and bearing 15 pecten spines; under surface of tarsus with a pattern of black as figured. Mid femora spinose beneath for their entire length; mid tarsomeres 2-4 strongly compressed. Tergite 7 with protruding, truncate median apical lobe, its lateral lobes slender, finger-like. Sternite 2 with a strong median process arising from base and extending nearly to apex. Sternite 6 simple; sternite 7 subtruncate apically, lateral margins with a brush of dense, long setae basally; sternite 8 attenuate, tip narrowly rounded. Parameres acuminate and densely setose subapically, flanges large, angular; cuspides rounded apically; digiti rod-like, slightly shorter than cuspides.

Coloration. Scape yellow, with a narrow black streak above and a small apical black spot; flagellum fuscous above, rufous beneath; mandibles, labrum, and clypeus light yellow; front yellow except black at ocellar area and with

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a pair of spots above antennal sockets barely connected to ocellar black; vertex black, barely connecting eye tops; occiput black but outer orbits yellow. Pronotum yellow; mesoscutum black except longitudinally yellow on sides and with paired yellow discal streaks which taper behind and are not connected to a yellow spot medioposteriorly; scutellum with a transverse white band, interrupted medially; metanotum with a complete white band; propodeum with a dorsal V-shaped white marking, light yellow laterally; pleura and venter yellow. Legs yellow except fore tibiae with several small black spots behind, fore tarsi patterned as figured; mid and hind legs black at femorotibial joints and tibiae with limited black markings. Tergite 1 with a transverse, sinuate white band; tergite 2 with a broad white band, nearly encircling black spots and interrupted medially; T3-6 with white bands biemarginate anteriorly, on 3 and 4 narrowly interrupted medially; tergite 7 with a median white spot; venter light yellow except process on sternite 2 streaked with black, also with median black spots on sternites 3 and 4, sternites 5 and 6 transversely black, sternite 7 black. Wings hyaline.

FEMALE

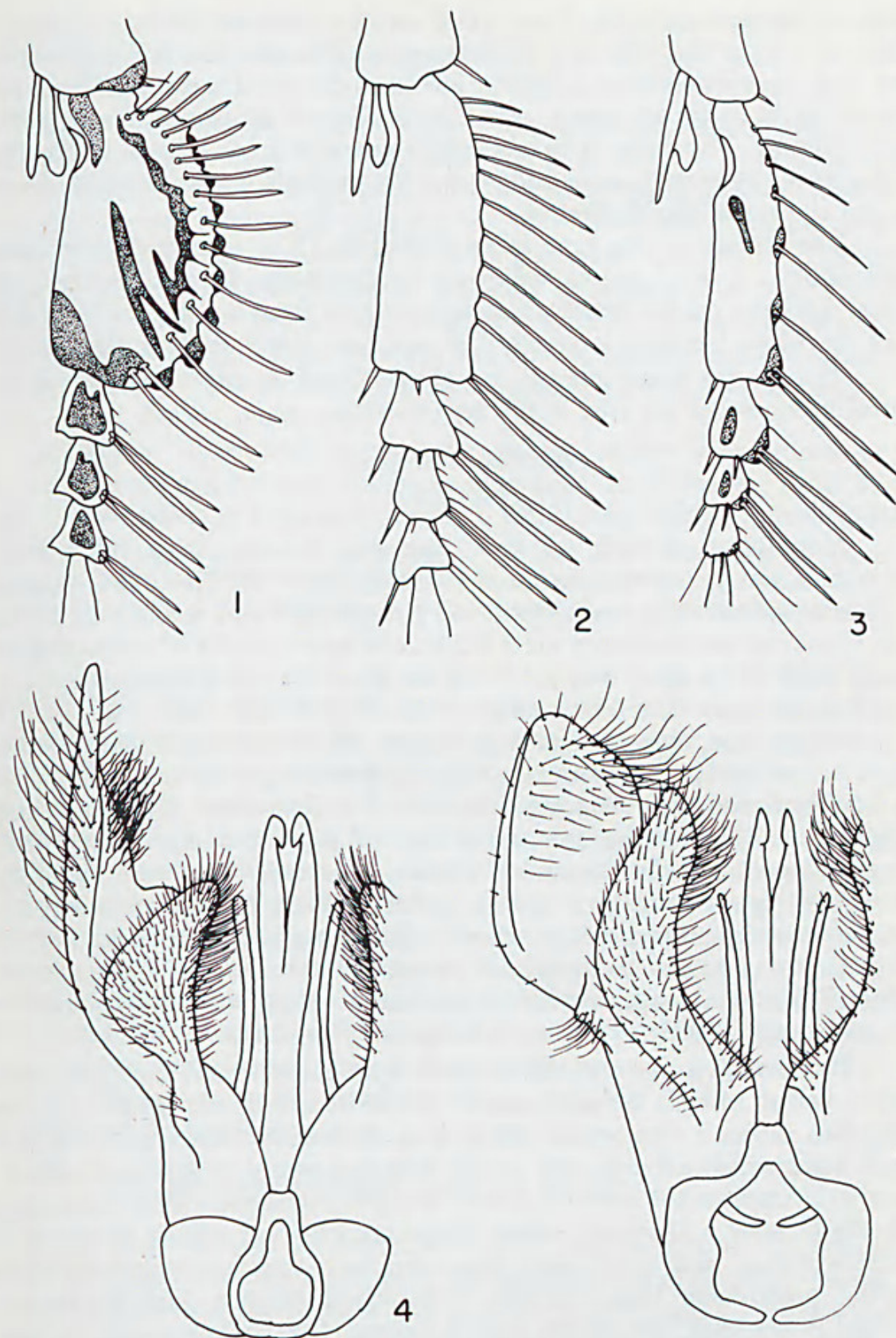
Morphology. Length 17.5 mm; fore wing 12.5 mm; wing index 1.85. Mandibles robust, strongly curved, tooth and cutting edge well developed, index 1.9. Clypeus 2.1 x as wide as high, protuberant, abruptly flattened over apical 0.7, flattened area with several strong punctures. Minimum width of front 0.56 x eye height; centre of vertex well below level of eye tops. Scape 2.8 x as long as wide; third antennomere 4.2 x as long as wide. Fore basitarsus somewhat broadened and flattened, 3.0 x as long as wide, bearing 12 pecten spines, most basal one quite small. Mesoscutum densely punctate, somewhat shining between punctures. Sternite 2 with sparse, coarse punctures except at extreme base and sides; tergite 6 coarsely punctate and with stiff lateral bristles.

Coloration. Similar to male except as follows: scape with a broader black streak; clypeus with a pair of large black spots; mesoscutal markings forming a complete U; markings on scutellum, metanotum, and propodeum broader and yellow in colour rather than white; metasomal markings light yellow to white, band on tergite 2 enclosing black spots, tergite 6 with a large white spot; venter largely yellow except for median black on sternites 4 and 5, sternite 6 black. Legs yellow except fore femora and tibiae streaked with black, mid and hind femora spotted with black apically and tibiae streaked with black.

MATERIAL STUDIED. *Holotype* ♂ and *allotype* ♀, Beeboom Crossing, Daly River, on Tipperary Station, Northern Territory, 28.xi.1972, T. Angeles and N. Forrester (Australian National Insect Collection, Canberra). *Paratypes*: 3 ♀♀, same data as type; 1 ♀, Swim Creek, Northern Territory, 13.x.1971, T. Weir and A. Allwood; 1 ♀, Wildman River, at Arnhem Highway, Northern Territory, 26.xi.1974, T. Weir and T. Angeles (Dept. Primary Production, Darwin); 3 ♀♀, Mt. Hart (in King Leopold Range, NE of Derby), Western Australia, 1-2.ii.1965, A. Douglas (Western Australian Museum, Perth).

DISCUSSION

A single female of this wasp was treated by Evans and Matthews (1973) as a variant of *mareeba* Evans and Matthews, of small size and having a white



Figs 1-5. (1-2) *Bembix gurindji* sp. n.: (1) basal segments of fore tarsus of ♂, viewed from beneath; (2) basal segments of fore tarsus of ♀, viewed from above. (3) *Bembix obiri* sp. n., basal segments of fore tarsus of ♂, viewed from beneath. (4) *Bembix gurindji* sp. n., ♂ genitalia, ventral aspect. (5) *Bembix obiri* sp. n., ♂ genitalia, ventral aspect.

spot on the apical tergite. Now that a longer series is available, including a male, it is clear that this is a discrete species. Females will key to *mareeba* but have a narrower front, a slightly less expanded front tarsus and 11 or 12 pecten spines on the basitarsus, as well as smaller average size and a maculated apical tergite. The male is immediately separable from related species by virtue of the 15 pecten spines and black lobes on the front basitarsus; the form of the clypeus is also distinctive.

The females in the type series vary from 15 to 18 mm in length and have either 11 or 12 pecten spines on the basitarsus. In one specimen the discal markings on the mesoscutum do not quite form a complete U, and in two the white band on tergite 2 does not completely enclose black spots.

The species name *gurindji* is aboriginal and is that of a tribe which formerly inhabited the area of the type locality.

Bembix obiri sp. n.

(Figs 3, 5)

MALE

Morphology. Length 16 mm; fore wing 11 mm; wing index 1.65. Mandibles weakly curved, tooth and cutting edge well developed; clypeus 1.75 x as wide as high, protuberant and strongly flattened medially on apical 0.6. Front narrow, minimum width 0.53 x eye height; centre of vertex slightly below level of eye tops. Scape 2.7 x as long as wide; third antennomere 3.2 x as long as wide. Fore femur simple, 3.3 x as long as wide; fore basitarsus 3.6 x as long as wide, outer margin with a series of rounded, black lobes bearing eight pecten spines; tarsomeres 2-4 also each bearing a black lobe laterally, and 1-3 each also with a black spot beneath. Mid femur with a series of sharp teeth beneath; mid tibia spinose at base of spur; mid tarsi unmodified. Tergite 7 with margins somewhat sinuate, convergent to a very shallowly emarginate apex. Sternite 2 with a curved, spinose process toward apex; sternite 6 with a rather weak, vaguely triangular subapical process; sternite 7 with a strong median carina apically; sternite 8 in the form of a downcurved spine. Parameres broad, inner margin strongly setose subapically; cuspides densely setose, slightly exceeding aedeagus; digiti rod-like.

Coloration. Scape yellow, streaked with black above; flagellum dark above, yellow to light brown beneath; mandibles and labrum white, clypeus white but suffused with yellow above; front yellow, eye tops connected by a black band which extends over ocellar area and nearly to antennal sockets; outer orbits yellow but vertex and occiput black. Pronotum yellow; mesoscutum black, with a U-shaped yellow discal marking and yellow on extreme sides; scutellum and metanotum black but each transversely marked with yellow; propodeum black dorsally, with yellow banding, laterally largely yellow; mesopleura and venter largely yellow. Legs yellow except femora streaked with black, coxae partly black, black at femorotibial joints, and fore tarsi blackened as described above. Tergite 1 black, with transverse yellow band; tergites 2 and 3 broadly banded with yellow, band on 2 enclosing a pair of black spots, that on 3 nearly enclosing such spots; tergites 4-6 with yellow bands biemarginate anteriorly; tergite 7 with a median yellow spot;

venter largely yellow laterally, black medially, the black broadening posteriorly so that sternite 6 is all black. Wings hyaline.

FEMALE

Morphology. Length 16.5 mm; fore wing 11.8 mm; wing index 1.65. Mandibles robust, strongly curved, index 2.1. Clypeus 1.95 x as wide as high, protuberant and flattened as in male. Minimum width of front 0.53 x eye height; centre of vertex slightly below level of eye tops. Scape 3.0 x as long as wide; third antennomere 4.5 x as long as wide. Fore femur 3.0 x as long as wide; fore basitarsus flattened, gradually broadened from base, 2.9 x as long as its greatest width, outer margin not darkly pigmented, weakly lobed, bearing 8 pecten spines. Mesoscutum shining, densely micropunctate; sternite 2 sparsely punctate medially, much more densely so laterally; tergite 6 with sparse, shallow punctures.

Coloration. Essentially as in male except yellow maculations of mesosoma somewhat broader, those on metasoma also broader, band on tergite 3 fully enclosing black spots, tergite 6 with a large median yellow spot.

MATERIAL STUDIED. *Holotype* ♂ and *allotype* ♀, 16 km E by N of Mt. Cahill, Northern Territory, 12°50'S 132°51'E, 13.vi.1973, T. Weir and T. Angeles (Aust. Nat. Insect Coll., Canberra). *Paratypes*: 1 ♂, 1 ♀, same data as type (Dept. Primary Production, Darwin).

DISCUSSION

The male runs to couplet 63 in Evans and Matthews (1973) but the fore basitarsus is intermediate in development between *oomborra* and *goyarra*. In other features expressed in the couplet (vertex below eye tops and black lobes on front basitarsus) agreement is with *oomborra*, which was described from a single male from Darwin. I at first thought these specimens might fall within the range of variation of *oomborra*, but clearly this is not the case, as the genitalia are very different, especially the much broader parameres. Also, the fore basitarsus is notably broader and more strongly lobed and the body is much more extensively maculated. The female runs to *loorea* Evans and Matthews, described from central Australia, and the fore basitarsus is much as figured for that species. It differs, however, in having the centre of the vertex below the level of the eye tops and in having U-shaped yellow scutal markings, black streaks on the femora, and enclosed black spots on tergites 2 and 3.

The species is named for Obiri Rock, near Mt. Cahill, the site of extensive aboriginal rock paintings.

Bembix kununurra Evans and Matthews

FEMALE

Morphology. Length 14 mm; fore wing 11 mm; wing index 1.8. Mandibles slender, slightly curved, tooth small but cutting edge well developed, index 2.4, total length 6.2 x minimum width basal of tooth. Clypeus 2.0 x as wide as high, rounded in profile. Minimum width of front 0.61 x eye height; centre of vertex level with eye tops. Scape 3.3 x as long as wide; third antennomere 4.4 x as long as wide. Fore femur 3.0 x as long as wide; fore basitarsus 3.0 x as long as wide, without dark pigmentation, outer margin serrate and bearing 6 pecten spines which decrease gradually in length towards base. Mesoscutum moderately shining, closely punctate; sternite 2 weakly depressed and coarsely

punctate medially, with small punctures laterally; tergite 6 and sternite 6 both with dark median streaks which are very slightly elevated.

Scape yellow except black above on apical 0.7; flagellum yellow beneath on basal third, beyond that testaceous beneath; mandibles and clypeus light yellow, labrum nearly white; front, vertex, and occiput yellow, blackened at ocelli and with a black streak above each antennal socket, also a small black spot at each upper, inner eye margin. Pronotum yellow; mesoscutum yellow except for 3 narrow black, longitudinal streaks, median streak not reaching posterior margin; scutellum transversely black at base, otherwise yellow; metanotum yellow; propodeum yellow except transversely black at base and with a pair of narrow, oblique black stripes; mesopleura and venter wholly yellow. Propodeum and tergite 1 with unusually dense, woolly hair. Legs yellow except femora and tibiae streaked with black and with some black at the coxa-trochanter and femur-tibia joints. Metesoma wholly yellow except for small black spots on tergite 1 and narrow apical black bands on all tergites, also median black streaks on the apical tergite and sternite. Wings hyaline.

MATERIAL STUDIED. 2 ♀♀, 1 ♂, 5 km N of Kununurra, Western Australia, 20.ix.1979, H. E. and M. A. Evans (1 ♀ in Australian National Insect Collection, Canberra, 1 ♀, 1 ♂ in University of Queensland, Brisbane).

DISCUSSION

This species was described from a single male from Kununurra. Like the male, the female is by far the most extensively maculated Australian *Bembix*, appearing virtually entirely yellow in the field. The dense, woolly pile on the propodeum and first metasomal tergite is also characteristic. The female will run to couplet 38 in the key of Evans and Matthews (1973) but fits neither half of the couplet well, as the mandibles are intermediate in structure.

Bembix wiluna Evans and Matthews

This species ranges through arid parts of the continent, from central New South Wales to Western Australia. It is not surprising to report it for the first time from Queensland, a pair taken 9 km S of Charleville, 18.x.1978, by J. C. Cardale (Australian National Insect Collection, Canberra).

Bembix allunga Evans and Matthews

This species has been reported from coastal localities from central Queensland to northeastern Western Australia. It is here reported from an inland locality well south of its previously known range: several females taken 10 km S of Coonabarabran, New South Wales, 15.i.1980, by H. E. and M. A. Evans and A. Hook (University of Queensland, Brisbane).

Bembix thooma Evans and Matthews

This species is here reported from Queensland for the first time, a male taken at Cunnamulla, 27.x.1979 by H. E. and M. A. Evans and A. Hook (University of Queensland, Brisbane). This wasp is widely distributed in the interior and is known to prey on wasps of the subfamily Thynninae.

Reference

- Evans, H. E. and Matthews, R. W., 1973. Systematics and nesting behaviour of Australian *Bembix* sand wasps. *Mem. Amer. ent. Inst.* 20: 387 pp.



Evans, Howard E. 1982. "Two new species of Australian *Bembix* sand wasps, with notes on other species of the genus (Hymenoptera, Sphecidae)." *Australian Entomological Magazine* 9(1), 7–12.

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