

A New Species of the Genus *Palarus* (Hymenoptera: Crabronidae)

Wojciech J. Pulawski¹ and Sarah K. Gess²

¹ *Department of Entomology, California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, California 94118, USA; e-mail: wpulawski@calacademy.org.* ² *Department of Entomology and Arachnology, Albany Museum and Department of Zoology and Entomology, Rhodes University, Grahamstown, 6139 South Africa; e-mail: s.gess@ru.ac.za.*

A new species, *Palarus inexpectatus*, is described from Dubai. It is closely similar to *Palarus jaxartes* Pulawski and Prentice, from which it differs by details of the elevation of sternum II and color, the male also by the venter of flagellomeres II-IX distinctly angulate near the midlength, the presence of a midtibial spur, and the shape of tergum VII. Three females and two males were collected on flowers of *Heliotropium kotschyi* Gürke (Boraginaceae), and one male on those of *Calligonum comosum* L'Herit (Polygonaceae). One prey, a male of *Bembix hauseri* Schmid-Egger, was taken from a nesting female. The nest, a sloping burrow, had been excavated.

When Pulawski and Prentice published their revision of *Palarini* in 2008, it was hoped that all the world species were included. In 2016, however, Sarah Gess collected seven specimens of an undescribed *Palarus* in Dubai that she submitted to Wojciech Pulawski for examination and description. Data on habitat, flower associations, prey and nest are those of Sarah Gess.

***Palarus inexpectatus* Pulawski, species nova**

Figures 1–6

NAME DERIVATION.— *Inexpectatus*, Latin for *unexpected*; with reference to the surprising discovery of this species.

POSITION WITHIN GENUS.— *Palarus inexpectatus* is a member of the *variegatus* species group. As such, it is characterized by the presence on sternum II of an elevated, transverse crest, the female pygidial plate with minute but well-defined longitudinal ridges, and the male pygidial plate bidentate apically and raised above the apex of tergum VII. The outer apical spines of female hindtarsomeres II and III, however, are slightly longer and thicker than in the other members of the group. The species obviously lacks the defining characters of the *interruptus*, *histrion*, and the *maculatus* groups (see Pulawski and Prentice, 2008).

Within the group, the new species resembles most closely *Palarus jaxartensis* Pulawski and Prentice. Both species share the following unique character combination: genal setae sinuous, some setae close to hypostomal carina slightly longer than midocellar width, least interocular distance about equal to midocellar width, female sternum II with non-dentate crest and a short, transverse platform just behind it (posterior margin of platform almost rectilinear), distance between crest and platform's posterior margin shorter than midocellar width, length of apical depression markedly greater than midocellar width, and male forebasitarsal venter with black, elongate spot.

TABLE 1. Comparison with *Palarus jaxartes*. — The two species differ as follows:

Character	<i>Palarus jaxartensis</i>	<i>Palarus inexpectatus</i>
Color of body maculae	pale yellow	brownish yellow
Color of frons	yellow up to about midheight	yellow only lateroventrally and between antennal sockets
Color of female gena	largely yellow	black
Color of flagellum	yellow or brown dorsally	all black
Color of mesopleuron	all or largely yellow	all black except yellow anterior to episternal sulcus
Color of propodeum	at least side of dorsum yellow	all black
Female sternum II: dentate carina immediately behind crest	absent	present
Color of female foretarsal venter	all yellow	with round, black, preapical spot
Venter of male flagellomeres	evenly convex	flagellomeres II-IX angulate
Apicomedian setae of male forecoxa	short, not forming a brush	long, forming a brush
Male midcoxal venter	flattened	not flattened
Male midtibial spur	absent	present
Lateral pygidial process of male	not extending beyond tergal apex	extending beyond tergal apex
Elevation of male sternum II	posterior margin even	posterior margin undulate laterally

DESCRIPTION.— Least interocular distance about $1.0-1.2 \times$ midocellar width in female, $1.1-1.3 \times$ in male. Occipital carina separated from eye margin at vertex by about hindocellar length in both sexes. Anterior margin of precoxal mesopleural declivity without angular prominence. Propodeal side finely ridged throughout or ridged only posterodorsally and posteroventrally, punctate except impunctate anteriorly.

Frons yellow laterally up to about midheight (yellow area narrowing dorsally) and between antennal sockets; mandible all yellow basally; scape yellow ventrally, black dorsally; pedicel and flagellum black. Pronotum yellow except black between streptaulus and collar; scutum yellow anterolaterally; scutellum, scutellar flange, metanotum, and metanotal flange brownish yellow; mesopleuron (except yellow preepisternal area), metapleuron, and propodeum black; mesothoracic venter black or yellow posteriorly in female, all yellow in male. Wing membrane nearly hyaline. Foreleg yellow, mid- and hindlegs brownish yellow; foretarsal venter with round, black, preapical spot. Terga brownish yellow except apical tergum black in both sexes.

♀ (Fig. 1).— Genal setae sinuous, those of genal ventral part about as long as midocellar diameter. Dorsal length of flagellomere I $2.0-2.2 \times$ apical width. Adlateral carina of tergum I gradually effaced posterad. Lateral margin of pygidial plate straight or minimally concave at about midlength. Ridges of pygidial plate nearly regular, markedly diverging posterad from midline. Sternum II (Fig. 2): transverse crest simple; transverse, obtusely dentate carina present immediately behind crest (visible only obliquely from behind; located between crest and row of long, erect

setae); with short, transverse platform just behind row of setae, posterior margin of platform sharp both mesally and laterally; distance between crest and posterior margin of platform one midocellar width; apical depression longer than midocellar width; swelling that borders apical depression extending to lateromedian angle of crest, without sharp tubercle. Length 13.8–14.5 mm.

♂.— Free margin of medioclypeus slightly arcuate. Genal setae sinuous, slightly shorter than midocellar width. Longest setae between mandibular condyle and notch slightly longer than midocellar width. Dorsal length of flagellomere I 1.9–2.0 × apical width; venter of male flagellomeres angulate (Fig. 3). Mesothoracic setae posterior of episternal sulcus slightly curved, about 0.5 × as long as midocellar width. Mesothoracic venter, before precoxal sulcus, with most punctures two to three diameters apart, and setae shorter than those on ventral portion of preepisternum. Metasternum setose throughout. Forecoxa without apicomedian platform, with apicomedian brush of dense setae. Midcoxal venter not flattened, with insignificant preapical tubercle, with a few, sparse setae, without posteroventral carina. Midtibial spur present, about as long as 0.3 × midbasitarsus length. Midbasitarsus slightly flattened laterally, not curved, its ventral margin with one preapical and one apical, short spine. Midtarsomeres II and III with apicoventral, round, circular, translucent pad. Tergum V with obtuse adlateral carina posteriorly. Tergum VI with adlateral carina. Tergum VII (Figs. 4, 5): pygidial plate concave, emarginate apically, raised above and projecting beyond tergal apex (lateral pygidial process separated from tergal apex by about 0.7 × midocellar width); lateral pygidial process widest anteriorly, processes not connected ventrally by V-shaped carina; side of tergam not markedly concave; adlateral carina evenly curved, not expanded; ventral margin of tergam close to adlateral carina, but largely visible in lateral view; carina broadening apically into rounded flange; setae longest on sides and venter of lateral pygidial process, not upcurved at tergal apex. Sternum II (Fig. 6) with transverse ridge before elevation, anterior margin of elevation even and posterior margin undulating. Sternum V with a few, sparse punctures or densely punctate next to apical depression; associated setae inconspicuous. Sternum VI, on disk, with many well-defined punctures, at least some of which are less than one diameter apart; associated setae inconspicuous, straight; adlateral carina obtuse, inconspicuous, present only basally, not acutely pointed posteriorly. Gonocoxite with narrow sclerotized area adjacent basoventrally to membranous area, with short but well-defined setae in distal third (Figs. 7, 8). Length 13.1–15.0 mm.

COLLECTING SITES.— A description of the collecting sites is given in Gess and Roosenschoon (2016).

HABITAT.— Sparsely vegetated sand dunes.

FLORAL ASSOCIATIONS.— Three females and two males were collected on flowers of *Heliotropium kotschyi* Gürke (Boraginaceae), and one male on those of *Calligonum comosum* L'Herit (Polygonaceae).

PREY.— One prey, a male of *Bembix hauseri* Schmid-Egger, was taken from a nesting female.

NESTING.— A female was observed carrying prey, a male of *Bembix hauseri*, to her nest entrance where she put it down before entering the nest. The nest had been excavated in sand near the base of a large *Heliotropium kotschyi* plant. The burrow of diameter 7 mm sloped down at an angle of 60° to the sand surface for 110 mm. No prey were found in the burrow.

RECORDS.— HOLOTYPE: ♂, UNITED ARAB EMIRATES: **Dubai:** Dubai Desert Conservation Reserve: Lucerne Farm at 24.77569°N 55.64268°E, 6 Apr 2016, S.K. Gess (Albany Museum, Grahamstown, South Africa).

PARATYPES: same locality and collector as holotype, 6 Apr 2016 (1 ♀, Albany Museum; 2 ♀, California Academy of Sciences) and 11 Apr 2016 (1 ♀, 1 ♂, Albany Museum); same data except not Lucerne Farm, dune area, grazing and browsing exclusion plot at 24.82096°N 55.61533°E, 3 Apr 2016 (1 ♂, California Academy of Sciences).



FIGURE 1. *Palarus inexpectatus* – female body in lateral view.



FIGURE 2. *Palarus inexpectatus* – sternum II of female in lateral oblique view.



FIGURE 3. *Palarus inexpectatus* – male flagellum.

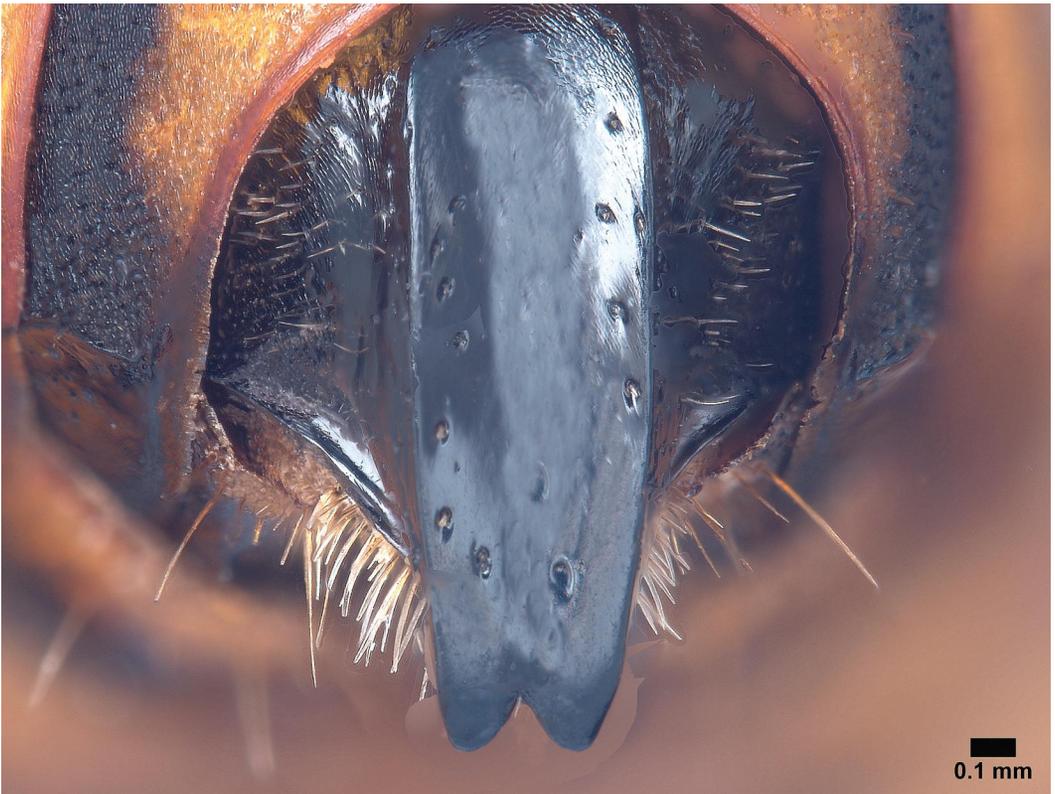


FIGURE 4. *Palarus inexpectatus* – male tergum VII in dorsal view.



FIGURE 5. *Palarus inexpectatus* – male tergum VII in lateral view.



FIGURE 6. *Palarus inexpectatus* – male sternum II in lateral oblique view.



FIGURE 7. *Palarus inexpectatus* – male genitalia in dorsal view.



FIGURE 8. *Palarus inexpectatus* – male genitalia in lateral view.

ACKNOWLEDGMENTS

Sincere thanks are expressed by Wojciech Pulawski to Erin Prado who generated the color illustrations using Auto-Montage software package by Syncroscopy, and to Robert L. Zuparko for having improved the manuscript.

Grateful thanks are expressed by Sarah Gess to the following people and organizations: Greg Simkins, Manager of the Dubai Desert Conservation Reserve (DDCR), for his invitation to work in the DDCR, and for having provided transport, accommodation, meals and laundry; Rhodes University for her airfare and travel insurance; and Tamer Khafaga, Conservation Officer, DDCR, for plant determinations.

REFERENCES

- GESS, S.K., AND P.A. ROOSENSHOON. 2016. A preliminary survey of flower visiting by aculeate wasps and bees in the Dubai Desert Conservation Reserve. *Journal of Hymenoptera Research* 52:81–141.
- PULAWSKI, W.J., AND M.A. PRENTICE. 2008. A revision of the wasp tribe Palarini Schrottky, 1909 (Hymenoptera: Apoidea: Crabronidae). *Proceedings of the California Academy of Sciences*, ser. 4, 59:307–479.