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A FIRST RECORD OF *PSEUDEPIPONA HERZI* (MORAWITZ) (HYMENOPTERA: VESPIDAE: EUMENINAE) FROM BASRAH PROVINCE, IRAQ

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ABSTRACT

***Pseudepipona herzi* (Morawitz, 1867) is reported for the first time in Iraq. Specimens were collected from *Conocarpus erectus* trees at two localities in Basrah Province (30.4464°N, 47.9781°E; 30.5328°N, 47.8569°E) on 4 April 2024. Morphological examination confirmed key diagnostic traits: body length 5.67–6.00 mm; black integument with distinct yellow maculations on head and metasoma; male antennal flagellomeres 10–13 strongly curved ventrally (J-shaped); clypeus trapezoidal, smooth, and entirely yellow. These characteristics differentiate it from congeners (e.g., *P. tricarinata*, *P. kozhevnikovi*) and align with established descriptions (Gusenleitner, 1995; van der Vecht and Carpenter, 1990). This finding extends the species' known geographic range eastward into southern Iraq and underscores the need for further surveys of Iraq's vespid fauna.**

Key words: *Pseudepipona herzi*, Eumeninae, solitary wasps, morphological description, first record, fauna of Mesopotamia

The subfamily Eumeninae (Hymenoptera: Vespidae) ranks among the most diverse vespid groups globally, comprising over 3,000 described species (Carpenter, 1986). These solitary wasps exhibit a cosmopolitan distribution across temperate and tropical regions, characterized by their distinctive nest-building behavior. They typically construct brood cells using mud or plant-derived materials a trait earning them the common names 'potter wasps' or 'mason wasps' (Yamane, 1990; Fateryga, 2010). The genus *Pseudepipona* belongs to this group and is distinguished from other genera by a compact body structure, enlarged head, curved antennae in males, and a contrasting black-and-yellow color pattern. This genus was described in comprehensive revisionary studies of Old World Eumeninae genera and was classified within a subgroup characterized by precise morphological features such as abdominal articulation and the absence of strong projections on the pronotum (Fateryga and Proshchalykin, 2022; and Yamane, 2003).

The species *Pseudepipona herzi* (Morawitz) was originally described from Central Asia, with subsequent records documenting its distribution in Iran, Afghanistan, Turkey (Giordani Soika, 1970), Oman and Yemen (Gusenleitner, 2000). Prior to this study, its occurrence in Iraq remained formally undocumented. This species is diagnostically characterized by: (1) distinct yellow maculations on the head and metasoma; (2) a conspicuously petiolate metasoma; (3) distinctly glittering oral structures; and (4) in males, a prominently protruding apical margin of the clypeus (van and Carpenter, 1990; Nemkov, 2007). *P. herzi* (Morawitz), despite the ecological and biological significance (Richards, 1979), has remained insufficiently studied in Iraq. Its species have not been adequately documented, particularly in southern regions. Consequently, the recording of *P. herzi* in Basrah Province represents a significant contribution to the taxonomic record of this family in Iraq and establishes a critical reference for delineating its geographic distribution boundaries within the Middle East (Carpenter, 1986).

MATERIALS AND METHODS

Specimens were collected on 4 April 2024 from Basrah Province in southern Iraq. Sampling was carried at two locations: An agricultural orchard in the Abu Al-Khasib (Yousifan) subdistrict (30.4464°N, 47.9781°E), The in Shatt Al-Arab (Al-Jebassi) subdistrict (30.5328°N, 47.8569°E).

The region features a subtropical climate with consistently elevated temperatures. Specimens were captured between 08:00 to 10:00 local time using nets during peak insect activity periods. Collected specimens were immediately transferred to plastic tubes containing cotton pads moistened with diluted ethyl ether for preliminary anesthesia. Preliminary morphological analysis was performed using a Leica EZ4 stereomicroscope and compound microscope. Use

the program ImageJ software (v.1.53) for dimensions (Schneider, et al., 2012). The following diagnostic characters were used- Shape and dimensions of the clypeus, cephalic and metasomal coloration patterns, antennal curvature in males, morphology of compound eyes, legs, and wings; using specialized keys for the family Vespidae and subfamily Eumeninae (Carpenter, 1986; Gusenleitner, 1995; van der Vecht and Carpenter, 1990). The specimen was comparatively analyzed against published descriptions of congeneric species within *Pseudepipona*, with external morphological features cross-referenced against established diagnostic characters in the literature.

RESULTS AND DISCUSSION

Morphological examination of the studied specimens confirmed precise anatomical congruence with the diagnostic characteristics of *P. herzi*, as documented by Gusenleitner (1996) and van der Vecht and Carpenter (1990).

Diagnosis: Total body length (Fig. 1A, B): 5.67-6.00 mm, The body is compact and robust , general color is black with yellow spots and bands on the body.

Head (Fig. 1C, D)-length 1.83 -1.88 mm, width 1.90-1.93 mm, black with the following yellow markings: A large yellow spot on the front, between the antennal sockets. Yellow orbital bands extending from the lower inner margins of the compound eyes. The clypeus is large, slightly convex, and broadly trapezoidal. Its anterior margin is slightly reflexed and smooth, without median teeth or emargination. The surface is smooth, shiny, and yellow in color, bordered by narrow black margins laterally. This clypeal configuration corresponds well to the species diagnosis in Giordani Soika (1970) and is a critical trait in separating *P. herzi* from *P. tricarinata* and *P. kozhevnikovi*, which possess more sculptured or emarginate clypeal margins. The compound eyes are large, oval, and strongly convex, positioned laterally with a slightly oblique vertical axis. The male antennae are composed of 13 flagellomeres, with the terminal 3 flagellomeres strongly curved ventrally forming a distinct hook-like structure (J-shaped). This curvature begins at the 10th segment and is diagnostic for the genus and critical for sex identification, total length is 2.73-3.00 mm, color black with subtle brownish tint apically.

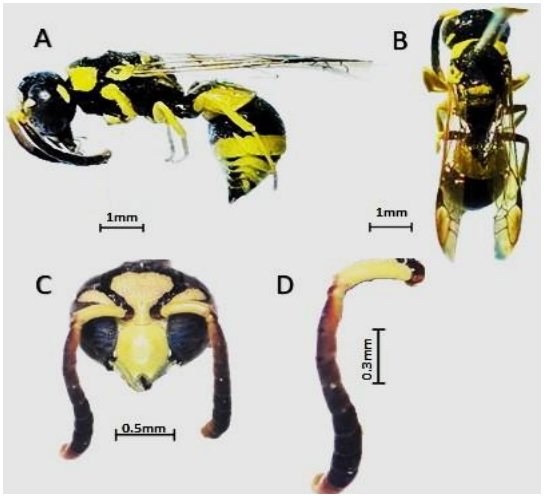

Fig. 1. *Pseudepipona herzi* (Morawitz, 1867) ♂A= lateral view, B= dorsal view, C= head in frontal view, D=antenna (J-shaped)

Thorax (Fig. 2 A, B): The mesosoma is smooth and moderately convex dorsally, the pronotum bears a yellow lateral stripe, and the mesepisternum is punctate. The tegulae are yellow,the propodeum is finely carinate with no spines, bearing a yellow basal band. Wings (Fig. 3C): Wings are hyaline, slightly brown-tinted near the costal margin. Venation is complete, with closed second submarginal cell a key character of Pseudepipona. Veins are brownish; stigma is dark brown.

Legs (Fig. 2D, E) are relatively slender: Fore femur length 1.2 mm, Hind femur length 1.6 mm. Tibiae and tarsi yellowish with darkened apices All tarsi possess paired claws with slight curvature.

Abdomen (Fig. 2 H): The first tergum is black with a thin transverse yellow line. Tergites II and III show broader yellow bands posteriorly, nearly reaching lateral margins. The ventral metasomal sterna are black to dark brown with slight yellowing at segmental junctions.

Material examined: Iraq • 3♂♂; Basrah, Abu Al-

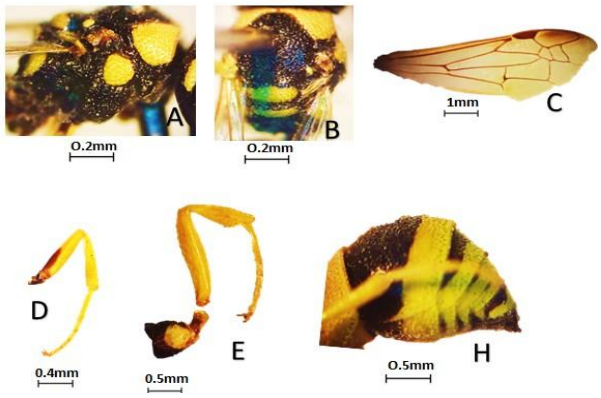

Fig. 2. A= thorax in lateral view, B= thorax in dorsal view, C= front wing, D= front Leg, E= hind Leg, H= Abdomen in lateral view

Khasib (30.4464°N, 47.9781°E); 4.iv.2024; M. Al-Etby leg. 2♂♂; Shatt Al-Arab (30.5328°N, 47.8569°E); same data. Depository: Natural History Museum, University of Basrah) UOB-ENT-2024-001–005).

Remarks: This species resembles other members of the genus such as *Pseudepipona tricarinata* and *P. herrichii*. However, *P. herzi* (Giordani, 1970; Kim and Yamane, 2003) can be distinguished by: (i) the presence of three discontinuous yellow bands on the abdominal tergites, and (ii) a weakly defined interantennal prominence. Furthermore, subtle diagnostic differences in the male clypeal morphology separate it from P. *kozhevnikovi*. Specifically, the clypeus in *P. herzi* exhibits: reduced lateral protrusion, more rounded lateral margins compared to the acutely angled lateral margins characteristic of *P. kozhevnikovi.*

Distribution: This record represents the first confirmed documentation of *Pseudepipona herzi* in Iraq, specifically from the southernmost region (Basrah Province). The species was not previously listed in published compendia of Iraqi fauna, such as the checklist by Al-Taweel and Dawah (2001). This finding indicates a significant eastward expansion of the species' known geographical range within the Middle East, potentially linked to climate-associated distributional shifts or changes in local vegetation pattern. The first record of *P. herzi* in southern Iraq represents a significant addition to the country's vespid fauna (Hymenoptera: Vespidae), particularly enhancing our understanding of biodiversity within the subfamily Eumeninae. Morphological examination confirmed precise alignment with established species descriptions, validating its taxonomic identity and underscoring the need to reassess the geographical ranges of neglected species in Iraqi entomological studies.

The species' occurrence in cultivated flowering habitats (*Conocarpus erectus* trees) demonstrates eumenine wasps' adaptive capacity to anthropogenic landscape changes and introduced vegetation. This study emphasizes the critical importance of targeted entomological surveys employing comparative morphological analysis and modern taxonomic keys, while advocating for Iraq's integration into regional initiatives to establish updated, verified entomological databases.

CONFLICT OF INTEREST

No conflict of interest.

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