



Introducing *Parapolybia escalerae* (Meade-Waldo, 1911) (Vespidae: Polistinae) as a paper wasp of the honey producer from Iran

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Abstract

Honey is a healing compound produced by the Apidae bees. So far, the only genus of *Apis* with 9 known species worldwide is a honey bee. But species of paper wasps in the Vespidae can also produce honey. This research was conducted to study and identify the species of paper wasp honey producer in the South of Kerman. For this purpose, the activity areas of this wasp were identified, and specimens of this paper wasp were collected for species identification. The specimens were identified by keys and related articles and Confirmed by Dr. James M. Carpenter at the American Museum of natural history. *Parapolybia escalerae* (Meado-Waldo) was described by Mead-Waldo in the London British Museum in 1911 as a single female specimen from southwestern Iran. The World distribution of this paper wasp is in Pakistan, Turkey, and Iran. According to the results of this study, the species *Parapolybia escalerae* (Meado-Waldo, 1911) was identified for the first time in southeastern Iran (south of Kerman). This species was distributed south of Kerman from the tropical foothills of Jabalbarz Mountains (southern Jabalbarz to Mohammadabad) and Bahraseman. *Parapolybia escalerae* is introduced in the world as a paper wasp species of a honey producer. The paper wasp is known as dry or chocolate honey and has medicinal use. In this study, the male and queen specimens were collected and identified for the first time. This study found that this species of paper wasp, like the *Apis florea*, produces wild honey. *A. florea* has open nests and small colonies of a single comb, but *P. escalerae* is in the dark space of mountains and cliffs and produces many combs. The activity of this species was mostly observed on the *Ziziphus* sp. and *Pistacia terebinthus* trees. This paper wasp has a social life and includes three forms of queens, workers, and males. So far, only two species of Honey producing paper wasps have been reported in South America, including *Brachygastra mellifica* (Say, 1837), known as the Mexican Honey Wasp and *Brachygastra lecheguana* (Latreille, 1824), which are paper wasps belonging to the subfamily Polistinae. These two species have round nests and build their nests on tall trees and the ground in open spaces. Their honey has medicinal use in different regions of South America and is collected by local people. The paper wasp species *P. escalerae* works in the crevices of the rocks and has several flat combs. In Iran, the local people of the southern regions of Iran use this honey as medicine to treat respiratory diseases.

Keywords: Paper wasp, *Parapolybia escalerae*, South of Kerman, Dry Honey

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Introduction

So far, 9 species of bees belonging to the *Apis* genus of the Apini tribe, known as stinging bees, and stingless honey bee species belonging to the Meliponini tribe, which belong to the Apinae subfamily and the Apidae family, have been known as honey producer species (Mossadegh, 2014). In addition to the Apidae family, paper wasps belonging to the Vespidae family were also introduced as honey-producing wasps. Two species of paper wasps *Brachygastra mellifica* (Say, 1837), known as Mexican Honey Wasp, and *Brachygastra lecheguana* (Latreille, 1824), are paper wasps belonging to the Polistinae subfamily that produce honey and their honey has medicinal uses (Bequaert, 1933). The wasps of the genus *Parapolybia* de Saussure, 1854 are paper wasps, two species of which are distributed in Iran, namely *Parapolybia escalerae* (Meade-Waldo, 1911) and *Parapolybia persica* (Meade-Waldo, 1911) (Meade-Waldo, 1911; Kojima & Carpenter, 1997). The species *P. escalerae* was first identified as a single sample of a female wasp by Mr. Meade-Waldo from Iran (Khuzestan) (Meade-Waldo, 1911). This species is distributed in Bushehr, Kerman, Lorestan (Ebrahimi & Carpenter, 2008), and Khuzestan (Meade-Waldo, 1911) provinces. Its global

distribution is reported from Iran, Turkey, and Pakistan (Yildirim & Kojima, 1999). This species was identified for the first time in the world as a honey-producing paper wasp.

Materials and Methods

To study and identify paper wasp species that produce honey, the activity areas of this bee species were identified and investigated in the southern region of Kerman. The wasp samples were collected for identification by mentioning the place's name. Specimens were identified by keys and related articles and confirmed by Mr. James Carpenter at the American Museum of Natural History.

Results and Discussion

Based on the results of this study, the species *Parapolybia escalerae* (Meade-Waldo) was identified for the first time from the southeastern regions of Iran (south of Kerman) as a species of honey production. The distribution of this species was observed in the south of Kerman from the tropical foothills of the Jabalbarz mountain range (southern Jabalbarz to Mohammadabad) and Bahr Aseman. The species *P. escalerae* is introduced in the world as a paper wasp of honey-producing species.

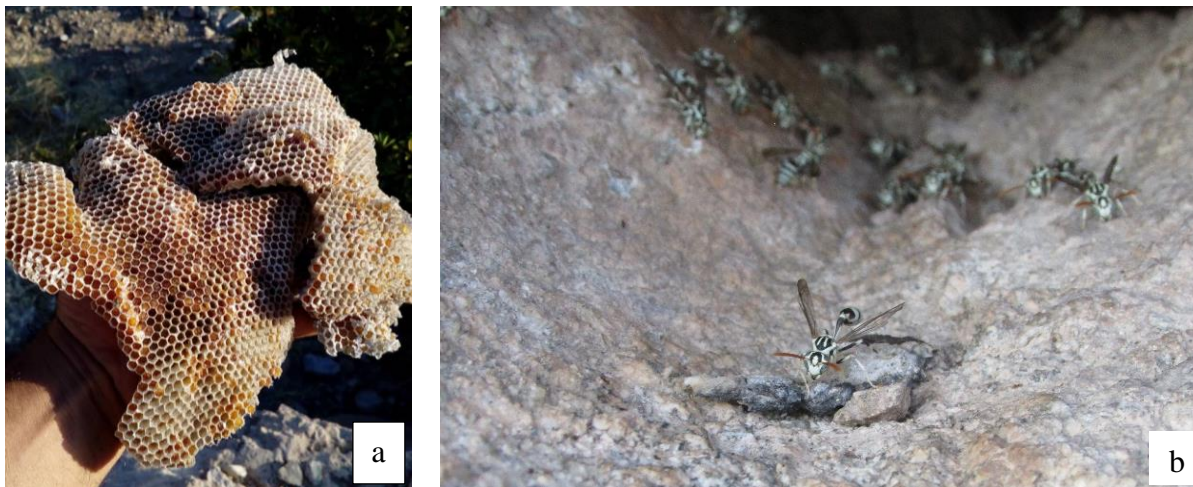


Figure1. (a) Paper wasp honey comb; (b) Complete paper wasp insect *Parapolybia escalerae*

The honey of this species of paper wasp is known as dry or chocolate honey and has medicinal uses. In this research, for the first time, the male and the queen wasp of this species were collected and identified. This study found that this species of wasp, like the *Apis florea*, produces wild honey. But its activity is unlike *Apis florea* which is in open space and single comb. It is in the dark space between mountains and rocks and produces several combs (Figure1). The activity of this species was observed mostly on *Ziziphus* sp. and *Pistacia terebinthus* trees. *Parapolybia escalerae* has a social life and includes three castes: queen, workers, and males. Local people

harvest this honey and use it for medicinal purposes, especially for respiratory diseases

So far, only two species of honey producing paper wasps have been reported in South America. These two species have round nests, and they build their nests on high trees and the ground in open spaces. Their honey has medicinal use in different regions of South America and is collected by local people (Sugden & McAllen, 1994). *Parapolybia escalerae* works in the crevices of the rocks, and it has several flat combs. In Iran, the local people of the southern regions use this honey as medicine to treat respiratory diseases.

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گزارش کوتاه

Parapolybia escalerae (Meado-Waldo, 1911) (Vespidae: Polistinae) معرفی زنبور

به عنوان زنبور کاغذی تولید کننده عسل از ایران

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چکیده

عسل یک ترکیب شفا بخش است که توسط زنبورهای عسل خانواده Apidae تولید می شود. تاکنون تنها زنبور عسل (*Apis*) با ۹ گونه شناخته شده در جهان بعنوان زنبور تولید کننده عسل شناخته شده است. اما گونه هایی از زنبورهای کاغذی خانواده Vespidae نیز قادر به تولید عسل می باشند. این تحقیق با هدف مطالعه و شناسایی گونه زنبور کاغذی تولید کننده عسل در منطقه جنوب کرمان انجام گرفت. بدین منظور مناطق فعالیت این گونه زنبور شناسایی و مورد بررسی قرار گرفت و نمونه های این زنبور جهت شناسایی گونه، جمع آوری شد. نمونه ها توسط کلیدها و مقالات مرتبط، شناسایی و توسط آقای جامس کارپنتر در موزه تاریخ طبیعی آمریکا تایید نهایی شدند. این گونه اولین بار در سال ۱۹۱۱ میلادی توسط آقای Mead-Waldo در موزه بریتیش لندن به صورت تک نمونه جنس ماده از جنوب غربی ایران توصیف شد. پراکنش جهانی این گونه زنبور کاغذی در پاکستان، ترکیه و ایران می باشد. براساس نتایج این تحقیق، گونه *Parapolybia escalerae* (Meado-Waldo) برای اولین بار از مناطق جنوب شرق ایران (جنوب کرمان) مورد شناسایی قرار گرفت. پراکنش این گونه در جنوب کرمان از مناطق کوهپایه ای گرمسیر رشته کوه های جبالبارز (جبالبارز جنوبی تا محمدآباد مسکون) و بحرآسمان مشاهده شد. گونه *P. escalerae* برای اولین بار در جهان بعنوان یک گونه زنبور کاغذی تولید کننده عسل معرفی می شود. عسل این گونه زنبور کاغذی معروف به عسل خشک یا شکلاتی می باشد و مصرف دارویی دارد. در این تحقیق برای اولین بار جنس نر و ملکه این گونه زنبور جمع آوری و شناسایی شدند. در این مطالعه مشخص شد که این گونه زنبور کاغذی مانند زنبور عسل کوچک *Apis florea*، عسل وحشی تولید می کند. اما فعالیت آن برخلاف زنبور عسل کوچک که در فضای باز بوده و تک شان می باشد، در فضای تاریک شکاف کوه ها و صخره ها می باشد و چندین شان تولید می کند. فعالیت این گونه بیشتر روی درختان کنار و پسته وحشی (بنه) مشاهده شد. این گونه زنبور کاغذی دارای زندگی اجتماعی است و شامل سه کاست ملکه، کارگرها و نرها می باشد. تاکنون تنها دو گونه زنبور کاغذی تولید کننده عسل در آمریکا جنوبی با نام های *Brachygastra mellifica* (Say, 1837) معروف به زنبور عسل مکزیکی (Mexican Honey Wasp) و *Brachygastra lecheguana* (Latreille, 1824) از زنبورهای کاغذی متعلق به زیر خانواده Polistinae می باشند، گزارش شده است. این دو گونه دارای لانه های گرد هستند و لانه هایشان را روی درختان بلند و در سطح زمین در فضای باز می سازند. عسل آنها در مناطق مختلف آمریکای جنوبی دارای مصرف دارویی است و توسط مردم محلی جمع آوری می شود. زنبور کاغذی گونه *P. escalerae* در شکاف صخره ها فعالیت می کند و دارای چند شان مسطح می باشد. در ایران مردم محلی مناطق جنوبی ایران از این عسل به صورت دارو برای درمان بیماری های تنفسی استفاده می کنند.

کلیدواژه ها: زنبور کاغذی، *Parapolybia escalerae*، جنوب کرمان، عسل خشک

دبیر تخصصی: دکتر آرش راسخ