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## First report of an exotic sap beetle, *Phenolia (Lasiodites) picta* (Macleay, 1825) (Coleoptera, Nitidulidae) from Iran with notes on its distribution range and damage on different hosts

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**ABSTRACT.** The sap beetle, *Phenolia (Lasiodites) picta* (Macleay) (Coleoptera, Nitidulidae), is the first record of this genus and species for the Iranian fauna. The larvae and adults were collected inside ripe fruits of *Citrus aurantium*, *Citrus sinensis* var. *valencia*, *Diospyros kaki*, *Pyrus communis*, *Prunus persica* and *P. persica* var. *nucipersica* in the gardens of Gavan Ahangar village of Mazandaran province. Notes on the distribution and observed damage are also presented.

**Key words:** Sap beetles, first record, Iran, invasive species

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## INTRODUCTION

The genus *Phenolia* Erichson, 1843, consists of four subgenera, among them the subgenus *Lasiodites* Jelínek, 1999 distributed in Palearctic and Australian regions. *Lasiodites* is characterized by the large body, subcostate elytra with distinct pubescence and strong punctation arranged in longitudinal series. Body colour is variable, mainly brownish with yellowish to pale orange spots on the elytra, sexual dimorphisms frequently involving tibial shape or shape of the elytral apex; males are characterized by markedly curved aedeagus (if observed in lateral view), however many of the external characters are variable (Kirejtshuk & Kvamme, 2002). Among the nine species of *Lasiodites* known to occur in the Palearctic region, *Phenolia (Lasiodites) picta* (Macleay, 1825), initially distributed in the eastern part of Palearctic and Oriental regions (Jelínek & Audisio, 2007), shows a recent wider distribution. It is regarded as the most widespread species of the subgenus and is currently expanding its distributional range in West Palearctic (Rattu et al., 2021). There was no record of *Phenolia* species in Iran.

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*Phenolia picta*, which is considered as an invasive species by some specialists, mostly lives on ripe and fallen fruits (Kirejtshuk & Kvamme, 2002; Montagud & Orrico, 2015; Sparacio et al. 2020; Rattu et al., 2021). According to the biological observations of Montagud & Orrico (2015), the female lays isolated eggs on the fruit or the substrate close to the fruits at night. After a few days, the larvae hatched and feed on that fruit or by the help of their well developed prothoracic legs search for other fruits. Pupations take place, at a depth of about one centimeter, in an oval chamber underground. The adults emerge about two weeks later. Many fruits including *Citrus* sp., *Ficus carica*, *Opuntia* sp., *Vitis vinifera* (Montagud & Orrico, 2015), *Prunus mume* (Naka et al., 2010; Montagud & Orrico, 2015), *Mangifera indica* (Abdullah & Shamsulaman, 2008) are feed by *Phenolia picta*. In this note, the genus and species of *P. picta* is reported for the first time from Iran. Short taxonomic comments, distributional notes and damage observation are also provided.

## MATERIAL AND METHODS

The specimens were collected in July 2020 from inside the fallen and ripe fruits on the branches of the following trees: *Citrus aurantium*, *Citrus sinensis* var. *valencia*, *Diospyros kaki*, *Pyrus communis*, *Prunus persica* and *P. persica* var. *nucipersica* in Gavan Ahangar village, Mazandaran province, Iran. The collecting area has a mild subtropical climate, a few kilometers south of Caspian Sea coast. Specimens were measured using a stereomicroscope Zeiss® Stemi SV8 with an eye-piece linear micrometer. The male genitalia was dissected, photographed and mounted on a card. The photos were taken using a 650D Canon® digital camera through an Olympus® SZH stereomicroscope and combined by the Helicon focus 7 software. The specimens are deposited in Hayk Mirzayans Insect Museum (HMIM) in the Iranian Research Institute of Plant Protection, Tehran, Iran.

## RESULTS

### *Taxonomic hierarchy*

**Class Insecta Linnaeus, 1758**

**Order Coleoptera Linnaeus, 1758**

**Family Nitidulidae Latreille, 1802**

**Subfamily Nitidulinae Latreille, 1802**

**Genus *Phenolia* Erichson, 1843**

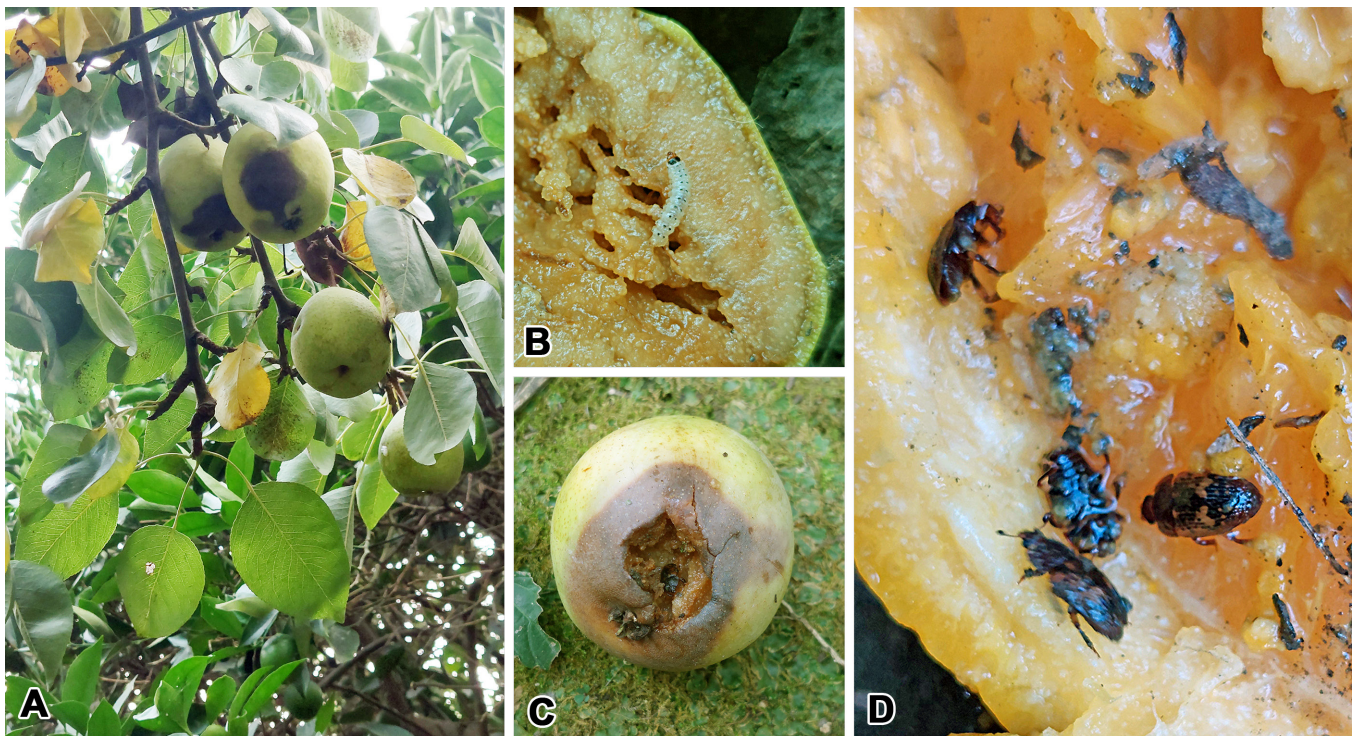
***Phenolia (Lasiodites) picta* (Macleay, 1825) (Figs 1-2)**

**Material examined.** Iran, Mazandaran province, Ghaemshahr, Balatajan rural district, Gavan Ahangar village, 36°25'31"N, 52°44'15"E, 133 m. a.s.l., June 2022, leg. M.Moradi, 16 specimens. (HMIM).

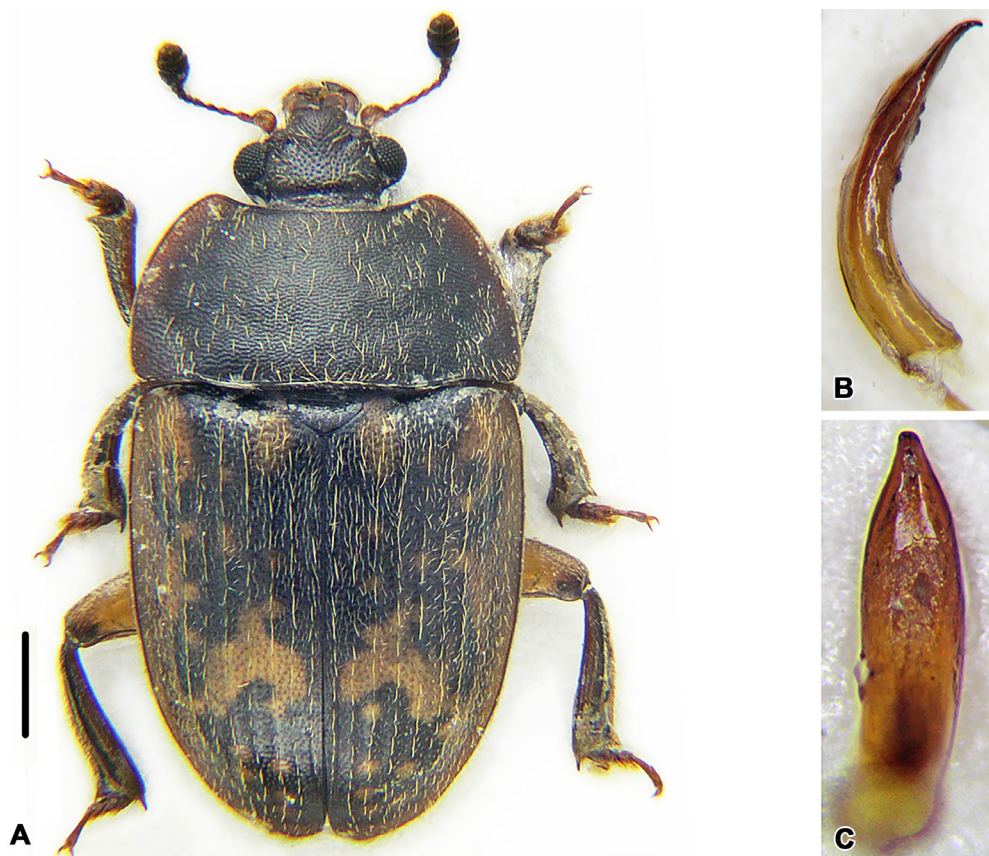
**Diagnostic characters.** Length 6.4–8.2 mm.; width 3.2–4 mm.; Body dark brown or reddish brown; lateral part of pronotum and elytra reddish; femora bicolorous, apically darker; elytra with red spots which form a curved band behind middle; pronotum with sparse pubescence, posterior angles of pronotum not projecting backward; pronotum and elytra flattened laterally; pro- and mesotibiae of males weakly curved; aedeagus with blunt apex, distinctly curved in lateral view.

**Biological note.** *Phenolia picta* was observed feeding on fallen and ripe fruits in many of the common orchards including *Citrus aurantium* L., *Citrus sinensis* (L.) Osbeck var. *valencia*, *Diospyros kaki* L., *Pyrus communis* L. and *Prunus persica* (L.) Batsch and var. *nucipersica*. The feeding activity of *P. picta* on *Diospyros kaki* is here first recorded.





**Figure 1.** Activity of *Phenolia picta* (Macleay, 1825) in some fruits: **A-C.** Damage on *Pyrus communis*; **D.** Damage on *Citrus sinensis* var. *valencia*.



**Figure 2.** *Phenolia picta* (Macleay, 1825), male: **A.** General habitus; **B-C.** Aedeagus; **B.** Lateral view; **C.** Ventral view. Scale bar 1 mm.

## DISCUSSION

The new record of *Phenolia picta* from north Iran together with the recent records of this species from the Mediterranean Basin (Jelínek et al. 2016; Kalaentzis et al., 2019; Sparacio et al., 2020; Rattu et al., 2021) and Caucasus (Khryapin, 2022), confirm the active spreading of this invasive species. Due to the introducing pathway, Rattu et al. (2021) assumed that *P. picta* might have been introduced as larvae or adults by the importation of tropical fruits. Currently, we can't recognize the introduction way of this beetle in Iran and it's not clear whether it has been actively dispersed from the adjacent countries or passively introduced by the fruit imports. More investigations are needed to detect the distributional sources of this exotic species. Our recent observations show the high activity of *Phenolia picta* mostly in ripe and rotten fruits (Fig. 1), which partly confirms the previous studies (Abdullah & Shamsulaman, 2008; Hishike et al., 2009; Naka et al., 2010). The reason for the presence of *P. picta* in the observed unripe fruits is not yet known, but could be due to the damage of fruit, likely caused by the activities of some primary pests. We observed *P. picta* in *Citrus aurantium*, *Citrus sinensis* var. *valencia*, *Diospyros kaki*, *Pyrus communis*, *Prunus persica* and *P. persica* var. *nucipersica*. The feeding activity of *P. picta* on *Diospyros kaki* is here firstly recorded.

## AUTHOR'S CONTRIBUTION

The authors confirm their contribution in the paper as follows: S. Serri: Identifying the specimens, preparing the photograph of the mounted specimen, writing the manuscript and correspondence; M. Moradi: Collecting the specimens and preparing the photographs in the field; P. Audisio: Confirming the identification of the specimens and revising the manuscript. All authors read and approved the final version of the manuscript.

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## AVAILABILITY OF DATA AND MATERIAL

Not applicable.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

## CONSENT FOR PUBLICATION

Not applicable.

## CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

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## اولین گزارش گونه غیر بومی (*Phenolia (Lasiodites) picta* (Macleay, 1825) (Coleoptera, Nitidulidae) از ایران و نکاتی درباره گستره پراکنش و خسارت آن بر میزبان‌های مختلف

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**چکیده:** جنس و گونه *Phenolia (Lasiodites) picta* (Macleay) برای اولین بار از ایران گزارش شد. لارو و حشره کامل این قاب‌بال از درون میوه‌های رسیده نارنج، پرتقال والنسیا، خرمالو، گلابی، هلو و شلیل در باغ‌های واقع در روستای گاوآن آهنگر استان مازندران جمع‌آوری شدند. در این مقاله نکاتی درباره پراکنش این حشره و خسارت آن بر میزبان‌های مختلف ارایه شده است.

**واژگان کلیدی:** سوسک‌های شیره‌خوار، گزارش جدید، ایران، گونه مهاجم