Short Communication

First Report of the Bark Beetle *Phloeosinus armatus* on the Mediterranean Cypress *Cupressus sempervirens* in Syria

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ABSTRACT

Aljouri, E., Gharib, M., Almanoufi, A., Daher-Hjai, N., and AlIssa-AlKharaba, H. 2018. First report of the bark beetle *Phloeosinus armatus* on the Mediterranean cypress *Cupressus sempervirens* in Syria. Tunisian Journal of Plant Protection 13 (2): 263-268.

The bark beetle *Phloeosinus armatus* is one of the most important pest that causes significant damages to the Mediterranean cypress *Cupressus sempervirens*. Adults of this insect were collected from the Mediterranean cypress trees from several sites located in the Eastern Ghouta near Damascus, South of Syria, in autumn 2014. The insect was morphologically described. Measurements were taken from different body parts. The adults are characterized by small sizes ranged between 3.60 to 3.88 mm for males and 3.88 to 4.08 mm for females, with a shiny chestnut color covered with short hair.The antennae are clavate (capitate) and consist of 5 flagella and their length ranged between 1.04 to 1.12 mm for males and 1.01 to 1.16 mm for females. They are characterized by chewing mouthpart type. The legs are similar in shape. The tarsus consists of 4 segments. The tip segment is prolonged and ends with a couple of claws. The leg length ranged between 1.26 to 1.49 mm for the males and 1.80 to 1.96 mm for females. This investigation, aiming mainly to describe *P. armatus*, is the first study in Syria.

Keywords: Bark beetle, cypress, morphological description, *Phloeosinus armatus*, Syria

The cypress trees *Cupressus sempervirens* are widely distributed in the Mediterranean region and in other areas with similar climate, including California, South Africa and southern Australia. However, its native distribution still unkown. *C. sempervirens* seems to be native from the Eastern Mediterranean region, including Libya, southern Greece, Turkey, Cyprus, Syria, Lebanon, and Iran (Govaerts 2015; USDA 2018).

Many cypress trees of *C. sempervirens* have died in forests, windbreaks, parks and gardens in Syria. However, they are in a state of decline due to many causal agents such as pathogens (*Seiridium cardinale*), insects (*Cinara*

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cupressi, *Phloeosinus* sp.) as well as abiotic agents, which are responsible for the most recurrent damages. In the Mediterranean region, the cypress bark beetle *Phloeosinus armatus* (Coleoptera, Curculionidae) is an important insect attacking particularly the Mediterranean cypress *C. sempevirens*. There are more than 70 species belonging to *Phloeosinus* genus and which are distributed in all continents (Wood and Bright 1992). Among them, six *Phloeosinus* species are native from Europe (Löbl and Smetana 2011). All of them are mainly associated with trees and shrubs from Cupressaceae family (Andrews 2002). *P. armatus* was described in 1887 based on specimens collected from *C. sempervirens*. Besides, the bark beetles of *Phloeosinus* genus are considered as an important factor of spreading of the fungus *S. cardinale* (Covassi et al. 1975; Pennacchio et al. 2013; Wagener 1939). Anderbrant et al. (1988) noted that beetles likely attack weakened trees under stress from fungi. In the last years, the neglecting and decreasing of irrigation of cypress trees in the Eastern Ghouta near Damascus caused the widespread and infestation by the bark beetle *P. armatus.*

The aim of this research was to collect information on this bark beetle species (*P. armatus*) in south of Syria as a preliminary report by the description of this pest morphologically and biometrically.

MATERIALS AND METHODS

Fifty samples of adults for bark beetles *P. armatus* were collected from several Mediterranean cypress *C. sempevirens* in the autumn of 2014, from three locations: Qarahta (33.39 N, 36.42 E), Al Ghuzlaniyah (33.39 E, 36.45 N) and Aqraba (33.44N, 36.38E); the three sites were located at altitude of 630 m, in the South of Syria. This region is characterized by a Mediterranean climate with hot and dry summer, cold winter and average rainfall about 250 mm. In the laboratory, samples were stored in 90% ethanol for the morphological analyses. The studied samples were classified according to key of *Phloeosinus* genus classification (Borror et al. 1976; Brues et al.1954; Ciesla 2011; Reitter 1887; Wood and Bright 1992). The biometric measurements of the samples were taken by Olympus (SZ61-Japan-WD38) using an eyepiece reticle and with a different magnification scale; all readings were converted to millimeters.

RESULTS AND DISCUSSION

Damage and symptoms.

Adults often bore into twigs for feeding and then burrowing under the bark to lay their eggs. The result of feeding causes dying the branch tips which remained often hanged on the trees fore a time before falling. The dead tips on the ground around the trees were symptomatic of bark beetle infestation.

Bits of very fine sawdust on the bark and wholes in the trees were observed. The cypress tree's crown turns first yellow and then reddish-brown (Fig. 1). Under the bark, tunnels in the wood have a pattern similar to the shape of the centipede (Fig. 2). The risk of this pest in this area is very considerable.

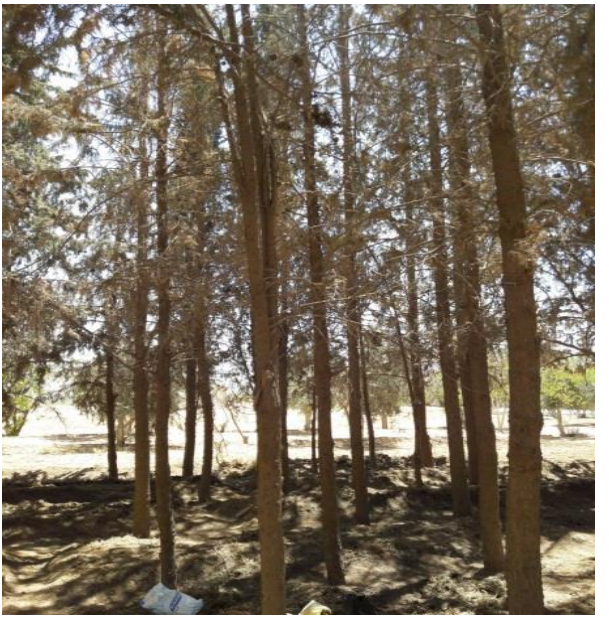

Fig. 1. Cypress branch dieback symptoms due to *Phloeosinus armatus*

Fig. 2. Cypress bark beetle gallery in cypress trunk

Adult morphology.

Body. Small, length 3-5 mm, with a chestnut color to a shiny dark brown, full-body covered with short hairs which are longer in front of the head and the last abdominal segments.

Head. Downward and forming an angle with the body. The antenna is clavate in form, its consist of five segments and the last one enlarged as clavate shape. Compound eyes are sideling, elongate and front edge are concave. The three simple eyes take the shape of the inverted triangle (its head down). Mouthparts are chewing type, mandibles appear out of the mouth and head clearly, and form a black-coloured chitin spine.

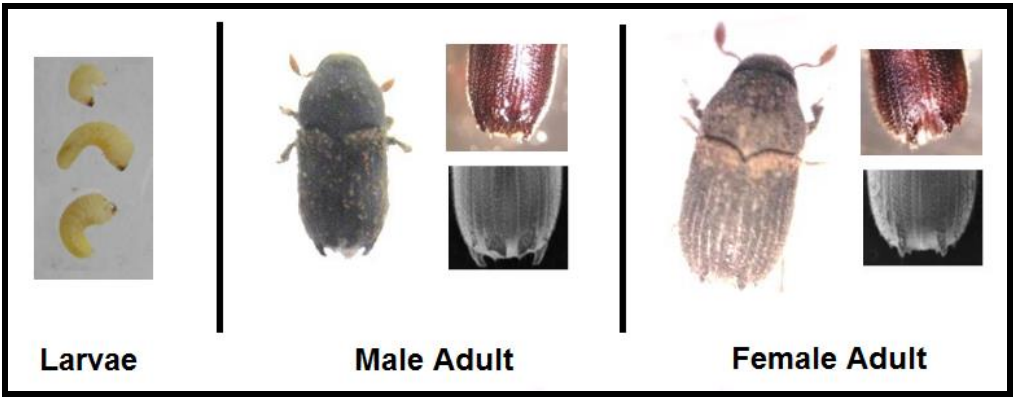

Fig. 3. *Phloeosinus armatus*: Larvae and adults (elytral declivity and dorsal view).

Thorax. Large, triangular pronotum, width scutellum doubler than sternum, and pleuron is diagonally with decorated small round pits.

Mesothorax. Horny wings (elytra wings) are decorated with longitudinal lines from pits. On each elytra, there are three pairs of symmetrical chitin enation which are present on the last third of them. These enations are wide and double in males compared to females. Enations vary in size so that the smaller ones will be at the end of the elytra and the larger toward the inside, it looks like a wide tooth form.

Legs. Each thorax segment has a pair of legs. These legs are similar in shape and size, however, female legs are longer than those of males with a wide femur covered by hairs on the back edge. Tibia is prolonged and enlarged from below and carrying the enlarged end several spines; there are on both front and rear borders hairs which are longer on rear border. Tarsus consists of 4 segments, the terminal segment is elongate and its length is equal to the other segments and has a pair of claw.

Abdomen. Short, less than a quarter of the body length and it consists of 9 segments, the first four segments are overlapping (compressed) and the last five ones are clear. There are three black lines separating the last four abdominal segments. The last abdominal segment is circular in shape, hiding underneath the reproduction system.

Biometric measurements.

The specimens collected in Southern Syria showed that the size of females was longer than that of males, about 3.97±0.084 mm for females and 3.78±0.011 mm for males; elytron length was 2.72 ±0.034 mm and 2.40±0.049 mm for females and males, respectively; antenna length was approximately similar for both; 1.07±0.068 mm and 1.08±0.029 mm for females and males respectively; while legs length was longer for females, about 1.87±0.068 mm and about 1.40±0.082 mm for males (Table 1). These values are similar to those reported by Pennacchio et al. (2013).

Table1. Morphometric parameters of adult bark beetle *Phloeosinus amateurs* on Mediterranean cypress *Cupressus sempervirens* in the Eastern Ghouta near Damascus, Syria

Body parts dimensions (mm)	Sex	Min	Max	Mean±SD
Overall Length	**Male**	3.60	3.88	3.78±0.011
	Female	3.88	4.08	3.97±0.084
Elytron Length	**Male**	2.36	2.48	2.40±0.049
	Female	2.68	2.76	2.72±0.034
Antenna Length	**Male**	1.04	1.12	1.08±0.029
	Female	1.01	1.16	1.07±0.068
Clavate Length	**Male**	0.48	0.52	0.51±0.018
	Female	0.48	0.56	0.52±0.033
Leg Length	**Male**	1.26	1.49	1.40±0.082
	Female	1.80	1.96	1.87±0.068

RESUME

Aljouri E., Gharib M., Almanoufi A., Daher-Hjai N. et AlIssa-AlKharaba, H. 2018. Premier signalement du scolyte *Phloeosinus armatus* sur le cyprès méditerranéen *Cupressus sempervirens* en Syrie. Tunisian Journal of Plant Protection 13 (2): 263-268.

Le scolyte *Phloeosinus armatus* est l'un des plus importants ravageurs qui cause des dégâts significatifs sur le cyprès méditerranéen *Cupressus sempervirens*. Des adultes de cet insecte ont été collectés d'arbres de cyprès dans plusieurs sites localisés a Ghouta-Est, près de Damas, au sud de la Syrie, en automne 2014. L'insecte a été décrit morphologiquement. Les mesures ont été prises de différentes parties du corps. Les adultes sont caractérisés par de petites dimensions allant de 3,60 à 3,88 mm pour les mâles et 3,88 à 4,08 mm pour les femelles, avec une couleur châtain-brillant couverte de courts poils. Les antennes sont clavées (capitées) et consistent en 5 flagelles et leurs longueurs varient de 1.04 à 1.12 mm pour les mâles et de 1,01 à 1,16 mm pour les femelles. Ils sont caractérisés par des pièces buccales du type broyeur. Les pattes ont la même forme. Le tarse est formé de 4 segments. L'extremité du segment est prolongée et se termine par deux griffes. La longueur des pattes se situe entre 1,26 et 1.49 mm pour les mâles et 1,80 et 1,96 mm pour les femelles. Cette investigtion, visant surtout de décrire *P. armatus*, est la première étude en Syrie.

Mots clés: Cyprès, description morphologique, *Phloeosinus armatus*, scolyte, Syrie

ملخص

الجوري، إبراهيم ومنيف غريب وعادل المنوفي ونورالدين ظاهر حجيج وهلا العيسى الخرابة. 2018. تسجيل أول لخنفساء القلف *Phloeosinus armatus* على السرو المتوسطي *Cupressus sempervirens* في سورية.

Tunisian Journal of Plant Protection 13 (2): 263-268.

تُعد خنفساء القلف *Phloeosinus armatus*، واحدة من أخطر الحشرات التي تسبب ضرراً كبيرا على أشجار السرو المتوسطي *Cupressus sempervirens*. جُمعت بعض الحشرات البالغة في خريف 2014 من أشجار السرو من عدة

مواقع في الغوطة الشرقية قرب دمشق، جنوب سورية. لإجراء دراسة مورفولوجية عليها، أخذت القياسات الشكلية لعدة أجزاء من الجسم. تراوحت أطوال الجسم ما بين 3.60-3.88 مم للذكور و3.88-4.08 مم للإناث. يبدو الجسم ذو لون كستنائي لامع، تغطيه شعيرات صغيرة بينما قرون الاستشعار تبدو صولجانية ومؤلفة من خمس عقل. يتراوح طول قرن الاستشعار بين 1.04-1.12 مم للذكور و1.01-1.16 مم للإناث. ينتمي فم هذه الحشره الى النوع القارض أم أرجلها فهي متشابهة في الشكل. تراوحت أطوال الساق ما بين 1.26-1.46 مم للذكور و1.80-1.96 مم للإناث. ويتألف الرسغ من أربع عقل مع العقلة الطرفية طويلة وتنتهي بزوج من المخالب. وتعد هذه الدراسة، المخصصة أساسا لتوصيف الحشرة، الأولى في سورية.

كلمات مفتاحية: خنفساء اللحاء، سرو متوسطي، سورية، وصف شكلي، *Phloeosinus armatus*

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