

## First Record of Two Beetle Species of Mesquite Trees *Prosopis juliflora* (Sw) D.C. in Yemen

Ismail Abdullah Muharram<sup>\*(1)</sup> Mohammed Saleh Al-Nossari<sup>(1)</sup> and Ahmed Mohammed Sallam<sup>(2)</sup>

(1). Agricultural Research and Extension Authority (AREA), Yemen.

(2). Nasser Faculty of Agriculture, Aden University, Yemen.

(\*Corresponding author: Dr. Ismail Abdullah Muharram. Email: imuharam@gmail.com).

Received: 18/02/2017

Accepted: 06/05/2017

### Abstract

Mesquite trees *Prosopis juliflora* (Sw) D.C. are wide spread in different countries of the world including Yemen, and occupied the fertile and marginal lands. However, the areas of this plant are increasing rapidly in Yemen. Mesquite trees are a host for large number of insects, which can be used to reduce the spread of the trees, and control it within an integrated management system, including the insects that feed on the seeds and pods of this plant. This study was carried out during 2004-2005 seasons, in Tehama, Lahje, and Abian where the trees of Mesquite are spread widely. The collection of mature pods of these trees were put in the insects breeding boxes. In this manuscript four insects species were identified, which belong to Coleoptera order as follow: *Algarobius prosopis* (LeConts); *Caryedon near serratus* (Olivier); *Bruchidius andrewesi* (Pic) that belong to Bruchidae family; and *Lasioderma serricorne* (Fabricius) which belongs to Anobiidae family. Two species were recorded for the first time in Yemen, *Caryedon serratus* (Olivier), and *Bruchidius andrewesi* (Pic), but, the others species were well known in Yemen, as pests on different crops including prosopis.

**Key words:** Mesquite trees, *Algarobius prosopis*, *Caryedon near serratus*, *Lasioderma serricorne*, *Bruchidius andrewesi*, Yemen.

### Introduction:

The species of mesquite trees *Prosopis juliflora* (Sw) D.C. belong to legumes *Fabaceae* family, they spread in large areas of Yemen, in the coastal and eastern plateaus, even wadis and mountain areas. The trees of *P. juliflora* rapidly spread covering large fertile agricultural and marginal lands. Unfortunately, no accurate statistics are available so far. The area of agricultural lands which are covered with this tree is about 350-400 ha (Al-Shurai and Labrada, 2006).

There are several ways to control the expansion of these trees, such as uprooting, burning, cutting the branches for manufacturing, and gathering pods for animals feeding. The plant is spreading everywhere, because of the large amount of seeds which the trees can produce. The most effective way to control and limit spreading this plant is the integrated management system, with the help of insects that cause damage to pods and seeds of these trees. The fauna of insects, which include a different species across various eco-geographical area are predominantly a local fauna, and adapted to these host plants with a limited distribution, and few of them are ubiquitous. Accordingly, the number of insect species which are harmful to different species of these trees, in different ecological regions, are very large.

Some species of beetles could attack prosopis pods, which aborted seeds up to 30%, and cause sometimes loss of whole pods (Kingsolver *et al.*, 1977; Simpson *et al.*, 1977 and Johnson, 1983). *Bruchidae* species caused a destruction between 15% to 99% of prosopis seeds, depending on its

number (Baes *et al.*, 2001).

Cates and Rhoades (1977); and Kingslover *et al.*, (1977) had described *Prosopis* leaves, and fruits as a source of food for insects. Ward *et al.*, (1977) furnished a check list of new world insects associated with *Prosopis*. Johnson (1983) dealt with the seed insects of *Prosopis* species. Insect pests of *P. juliflora* of some country specific lists are available in Brazil (Arruda *et al.*, 1988), and India (Singh, 1998). Smith and Ueckert (1974), reported that a seasonal insect control program on mesquite revealed that, the native insect populations generally reduced the numbers of mesquite pods produced per tree, the total numbers of seeds per pod, and the percentage of good seeds.

All of these species are spread in different countries in the world, they are feeding not only on the mesquite trees, but also on the other crops like cereal grains, groundnut (*Arachis hypogaea*), tamarind (*Tamarindus indica*), and the pods and seeds of Acacia trees (Prevett, 1967; De Cellam, 1969; Arora, 1977, and Singh and Toky, 1990). Furthermore, Swier (1974) indicated that the percentage of seeds of *P. juliflora* which were damaged by *Algarobius prosopis* ranges between 8-75%. While Satya and Jindal (1994) indicated that the percentage of infestation of *Bruchidius andrewesi* on acacia pods reached 5-19%, while it is ranged between 5-29% on seeds.

As a result of our survey we found that some insects mainly attacking the pods and seeds, so, they can play an important role to control and limit the spreading of mesquite trees in the agricultural land. The main aim of this report is to report the two beetles species for the first time in Yemen

#### **Material and methods:**

The survey was done in the areas where the trees of *Prosopis ssp.* are growing in Tehama, Lahje and Abian provinces in Yemen, during the years of 2004 and 2005. Number of maturing pods of *P. juliflora* were collected, and were put in cotton bags. Those samples were taken to the research laboratory in the Agricultural Research and Extension Authority (AREA) located in Dhamar province (100 km far from the capital city of Sana'a). Those pods were put in plastic cages for insects breeding. The size of these cages is 50 cm<sup>3</sup>. The cages windows were covered with muslin.

The insects were gathered every three days. Also, Insects with similar exterior were placed in a glass tubes with alcohol liquid. Each sample has two tubes, labeled with a recorded date, area, name of collector, and number. The samples were collected from Tehama areas, then were sent to Queens Plant Protection Research Institute, Pretoria, South Africa for identification. While the other samples that were collected from Lahje, and Abian provinces were sent to Museum National d'Histoire Naturelle, Paris, France. Same samples were kept in the lab.

#### **Results and discussion:**

Three species of Coleoptera order have been sent for identification to Queens Plant Protection Research Institute in South Africa. Two of them belong to Bruchidae family as follow: *Algarobius prosopis* (LeConte), *Caryedon near serratus* (Olivier), and one species belongs to Anobiidae family, *Lasioderma serricorne* (Fabricius). All of these species found on the pods and seeds of *Prosopis juliflora*. Two species which belong to family Bruchida: *Bruchidius andrewesi* (Pic) *Caryedon serratus* (Olivier), were registered in the samples which have been sent to Museum National d'Histoire Naturelle, Paris/France. All of these species are spread in different countries in the world, and they are well known as a pests of mesquite trees (*P. juliflora*) and other crops.

#### **Conclusion:**

Referring to the available obtained insect identification in Yemen through the different concerning institutions such as Agricultural Research and Extension Authority (AREA); Department of Plant Protection, Ministry of Agriculture and Irrigation (MAI); Nasser's Faculty of Agricultural Sciences,

Aden university etc., it was found that both *Caryedon serratus* (Olivier), and *Bruchidius andrewesi* (Pic) belong to the Bruchidae family, and they are new species not yet recorded or identified in Yemen. Therefore, the other two species *Algarobius prosopis* (LeConte), and *lasioderma serricornis* (Fabricius) are familiar in Yemen as pests for different crops including *prosopis*. The species of *Algarobius prosopis* (LeConte), *Caryedon serratus* (Olivier), and *lasioderma serricornis* (Fabricius) were found in Tehama area, and the species of *Bruchidius andrewesi* (Pic), belongs to Lahje and Abian areas. The species of *Caryedon serratus* (Olivier) is common in three areas i.e., Tehama, Lahje and Abian.

The study shows the possibilities of using one or some of these insects to control, and reduce the spread of mesquite trees in agricultural and marginal lands.

#### **Acknowledgement:**

The authors are grateful to Delobel Alex, and Grobbelaar, Beth from Plant Protection Research Institute, Queens Wood, Pretoria, South Africa, and Museum National d'Histoire Naturelle, Paris, France, for their assistance in identification. Also to Dr. Ali alshorai, cereal and legume scientist; Wadie Al Slowe, plant protection researcher in Agricultural Research and Extension Authority (AREA).

#### **References:**

- Al-Shurai, A.; and L. labrada (2006). Problems posed by *prosopis* in Yemen. FAO, Plant production and protection division. Pp 21-27.
- Arora, G.L. (1977). Taxonomy of the Bruchidae (*Coleoptera*) of Northwest India: Part 1. Adults. Oriental Insects Supplement. 7: 1-132
- Arruda, G.P.; E.C. De Arruda; A.B.R. Dos Santos; and A.C.A. Holanda (1988). Entomological observations. In: Habit, M.A. and Saavedra, J.C. (eds.), The Current State of Knowledge on *Prosopis juliflora*. FAO, Rome. Pp 327-333.
- Baes, P.O.; M. De Viana; and M. Saravia (2001). The fate of *Prosopis ferox* seeds from unremoved pods at National Park Los Cardones. Journal of Arid Environments. 48: 185–190.
- Cates, R.G.; and D.F. Rhoades (1977). *Prosopis* leaves as a source for insects. In Simpson, B.B. (ed.), Mesquite: Its Biology in Two Desert Scrub Ecosystems. Dowden, Hutchinson and Ross, Stroudsburg, Pa., U.S.A. Pp 61-83.
- De Cellam, J. (1969). Le Parc National du Nikilo-Koba (Senegal). Fascicule III.XVIII Coleoptera Bruchidae. IFAN-Dakar, Senegal.
- Johnson, C.D. (1983). Handbook on seed insects of *Prosopis* Species: Ecology, control and identification of seed infesting insects of new world *Prosopis*. FAO, Rome.
- Kingslover, J.M.; C.D. Johnson; S.R. Swier; and A. Teran (1977). *Prosopis* fruits as a source for invertebrates. In Simpson, B.B. (ed.), Mesquite: Its Biology in two desert scrub ecosystems. Dowden, Hutchinson and Ross, Stroudsburg, Pa., U.S.A. Pp 108-122.
- Satya, Virand S.K. Jindal (1994). Fruit infestation of *Acacia tortilis* (Forsk) Hyne by *Bruchidius andrewesi* Pic. (Coleoptera: Bruchidae) in the Thar desert. Forest Ecology and Management. 70: 349-352.
- Simpson, B.B.; J.L. Neff; and A.R. Mol- denke (1977). *Prosopis* flowers as a resource. Pp 84–107 in B. B. Simpson, ed. Mesquite: Its biology in two desert scrub ecosystems.
- Singal, S.K.; and O.P. Toky (1990). Carryover of bruchid, *Caryedon serratus* (Olivier) (Coleoptera) from field to stores through seeds of *Acacia nilotica* (L.) Willd in India. Tropical Pest Management. 36: 66-67.
- Singh, M.P. (1998). Injurious hexapoda associated with *Prosopis*. In *Prosopis* species in the arid and

semiarid zones of India. edited by J.C. Tewari, N.M. Pasiecznik, L.N. Harsh and P.J.C. Harris. Published by Prosopis society of India and the Henry Double day Research Association. Pp 105-108.

Smith I.L.; and D.N. Ueckerk (1974). Influence of insects on mesquite seeds production. journal of range management. 27(1):61-65.

Prevett, P.F. (1967). Note on the biology, food plants and distribution of Nigerian Bruchidae (Coleoptera) with particular reference to the Northern Region. Bulletin of Entomology Society (Nigeria). 1: 3-6.

Ward, C.R; C.W. O'Brien; L.B. O'Brien; D.E. Foster; and E.W. Huddleston (1977). Annotated check list of New World insects associated with *Prosopis* (Mesquite). Technical Bulletin. 1957, 4 SDA.

## تسجيل جديد لنوعين من الخنافس على أشجار المسكيت *Prosopis juliflora* (Sw) D.C. في اليمن

إسماعيل عبدالله محرم\*<sup>(1)</sup> ومحمد صالح النصيري<sup>(1)</sup> وأحمد محمد سلام<sup>(2)</sup>

(1). الهيئة العامة للبحوث والإرشاد الزراعي، صنعاء، اليمن.

(2). كلية ناصر للعلوم الزراعية، جامعة عدن، اليمن.

(\*للمراسلة: أ.د. إسماعيل عبدالله محرم. البريد الإلكتروني: [imuharam@gmail.com](mailto:imuharam@gmail.com)).

تاريخ القبول: 2017/05/06

تاريخ الاستلام: 2017/02/18

### الملخص

تنتشر أشجار المسكيت (*Prosopis*) في مناطق متعددة من العالم ومنها اليمن، وتشكل عبء على الأراضي الزراعية الخصبة والهامشية. تتسع المساحات التي يحتلها النبات بصورة اطرادية في اليمن، كما أنها عائل رئيسي للعديد من الحشرات والتي يمكن استخدامها للحد من انتشار هذا النبات والسيطرة عليه ضمن برنامج إدارة متكامل، ومنه استخدام الحشرات التي تتغذى على البذور والقرون لهذا النبات. نفذ البحث خلال الموسمين 2004 و2005 في كل من مناطق تهامة، ولحج وأبين حيث تنتشر فيها أشجار المسكيت بشكل واسع، حيث تم تجميع القرون الناضجة لهذا النبات ووضعها في صناديق خاصة بتربية الحشرات البالغة. تم تعريف أربعة أنواع حشرية من غمديات الأجنحة هي:

*Caryedon near serratus* (Olivier), *Bruchidius andrewesi* (Pic) *Algarobius prosopis* (LeConts)

من فصيلة Bruchidae، والنوع *Lasioderma serricorne* (Fabricius) من فصيلة Anobiidae، حيث تم تسجيل النوعين: *Caryedon serratus* (Olivier) و *Bruchidius andrewesi* (Pic) لأول مرة في اليمن، بينما يعد النوعين الآخرين معروفين كأفتين على محاصيل مختلفة، منها أشجار المسكيت.

الكلمات المفتاحية: أشجار المسكيت، *Lasioderma serricorne*، *Algarobius prosopis*، *Caryedon near serratus*، *Bruchidius andrewesi*، اليمن.