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New Record of The Billbug Genus *Sphenophorus* Schoenherr, 1838 (Coleoptera: Curculionidae: Dryophthorinae) From Egypt

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ABSTRACT

Sphenophorus weevils live on the ground, beneath the grass, and are known as primary pests because they lay eggs within the tissue of the stems of plants causing extinct damage to the stem, crown, and roots, leading to plant death. The adult is typically weevil-like in appearance with a short, broad, recurved snout. In the field of sugarcane crop located in Qena, Southern Egypt Individuals of billbugs appeared to look different morphologically from the most relative coexisted specimens. Specimens have been collected and sent to *some* world experts, they commonly suggested that the specimen is billbug species of the genus *Sphenophorus* but they cannot confirm the species. During the present work, the specimens were described, photographed, and identified using the available taxonomic keys and previous descriptions. The taxonomic work confirmed that the specimens belong to *Sphenophorus venatus* Chittenden (hunting billbug) and were reported for the first time from Egypt. This finding with data about damage, distribution, and host plants contributes to enriching lists of Egypt's insect fauna and conservation of biodiversity.

INTRODUCTION

Curculionidae is a cosmopolitan family and among the largest in the order Coleoptera (about 48,000 species) (Name *et al.* 2007). Hunting billbug (*Sphenophorus venatus* Chittenden) was described by Chittenden (1904) as *S. vestitus* and was later placed under *S. venatus*. It is an important pest of many host species including most species of grasses and sedges (Huang and Buss, 2013). In Egypt, Curculionidae is represented by 301 species within 81 genera of 20 subfamilies. The Dryophthorinae were not recorded in Egypt in any of the available published sources, e.g., Alfieri (1976) in his valuable catalog " The Coleoptera of Egypt" didn't record any member of this subfamily within Curculionidae, also, ministerial decree (Egypt), No 3007 (2018) concerning the quarantine pest list for Egypt, recorded *Sphenophorus venatus* under title " Unrecorded pests to be declined entry into Egypt". There are no valid publications mentioned and studied such groups in Egypt, therefore, the current work announced the genus *Sphenophorus* and *S. venatus* as recorded from Egypt for the first time. The genus *Sphenophorus* is the cosmopolitan genus (Alonso-Zarazaga and Lyal, 1999), with nine species recorded in the Palearctic Region (Alonso-Zarazaga, *et al.*, 2017).

MATERIALS AND METHODS

Insect Specimens' Collection and Preserving:

The field survey was conducted on a sugarcane field in Qena governorate, southern Egypt in 2019. The specimens were collected by hand from the mud, roots, and stem of the plants (Figs.1-4), killed and preserved in ethyl acetate, mounted on a paper card, and photographed.

Identification:

As the collected specimens differ from that of the Egyptian fauna, specimens were sent to some experts, namely, Dr. Lee Miller, University of Missouri, Division of plant sciences, Columbia, USA, Dr. Michael L. Ferro, Clemson University, South Carolina, Arthropod collection, department of plant and environmental sciences, USA and Dr. Nico Franz and Johnson, M. Andrew, Arizona State University, USA. They suggested that the specimens are billbug species of the genus *Sphenophorus* but couldn't determine the species if they belong to *S. venatus* (as it is characterized by raised Y-shaped marking on the thorax) or *S. parvulus*. Identification is carried out depending on description and using taxonomic keys and any available images.

RESULTS AND DISCUSSION

Dryophthorinae:

The weevil of subfamily Dryophthorinae is one of the most economically important insect groups (Rugman-Jones *et al.*, 2013; van Huis *et al.*, 2013). Dryophthorinae includes about 1,200 species in 152 genera and five tribes (Anderson & Marvaldi, 2014; Oberprieler *et al.*, 2007).

Diagnosis (After Vaurie, 1951):

Antennal club truncated cone, with a spongy distal part; funiculus with four to six articles; scrobe short. Prementum hidden. The apex of tarsal segment 5 with dorsal and ventral lobes extended between claws.

Genus *Sphenophorus* Schoenherr, 1838, (After Vaurie, 1951):

Calendra Clairville and Schellenberg, 1798, New York Ent. Soc., vol. 26, p. 210.

PIERCE, 1919, Proc. Ent. Soc. Washington, vol. 21, p. 26.

Calandra, Latreille, 1810, Consideration's generals, insects, pp. 223, 431 [genotype].

CSIKI, 1936, in Junk, Coleopterorum catalogues, pt. 149, p. 49.

Sphenophorus Schoenherr, 1838, Genera et species curculionidum, vol. 4, p. 874.

Genotype: *Calendra abbreviata* Fabricius, 1798, Halle, Saxony.

Nomenclatorial Notes:

This genus was formerly called *Calendra* Clairville and Shellenberg, (in some publications. International Commission of Zoological Nomenclature (ICZN), consulting experts, finally rejected the names *Calendra* and they recommended the *Sphenophorus* as the valid name (ICZN 1958, 1959).

Sphenophorus venatus (Figs. 5&6):

Rhynchophorus venatus Say, 1831, Description of new species of Curculionites of North America, p. 22.

Sphenophorus venatus, Horn, 1873, Proc. Amer. Phil. Soc., vol. 13, p. 426. Chittenden, 1904, Proc. Ent. Soc. Washington, vol. 6, p. 133.

Calendra venatus, Satterthwait, 1931, Ann. Ent. Soc. Amer., vol. 24, p. 162; 1932, U. S. Dept. Agr., Farmers' Bull., no. 1003, pp. 16, 17, figs. 9, 25. Satterthwait, 1942, Ent. News, vol. 53, p. 42.

Rhynchophorus immunis Say, 1831, Description of new species of Curculionites of

North America, p. 23.

Rhynchophorus placidus Say, 1831, loc. cit.

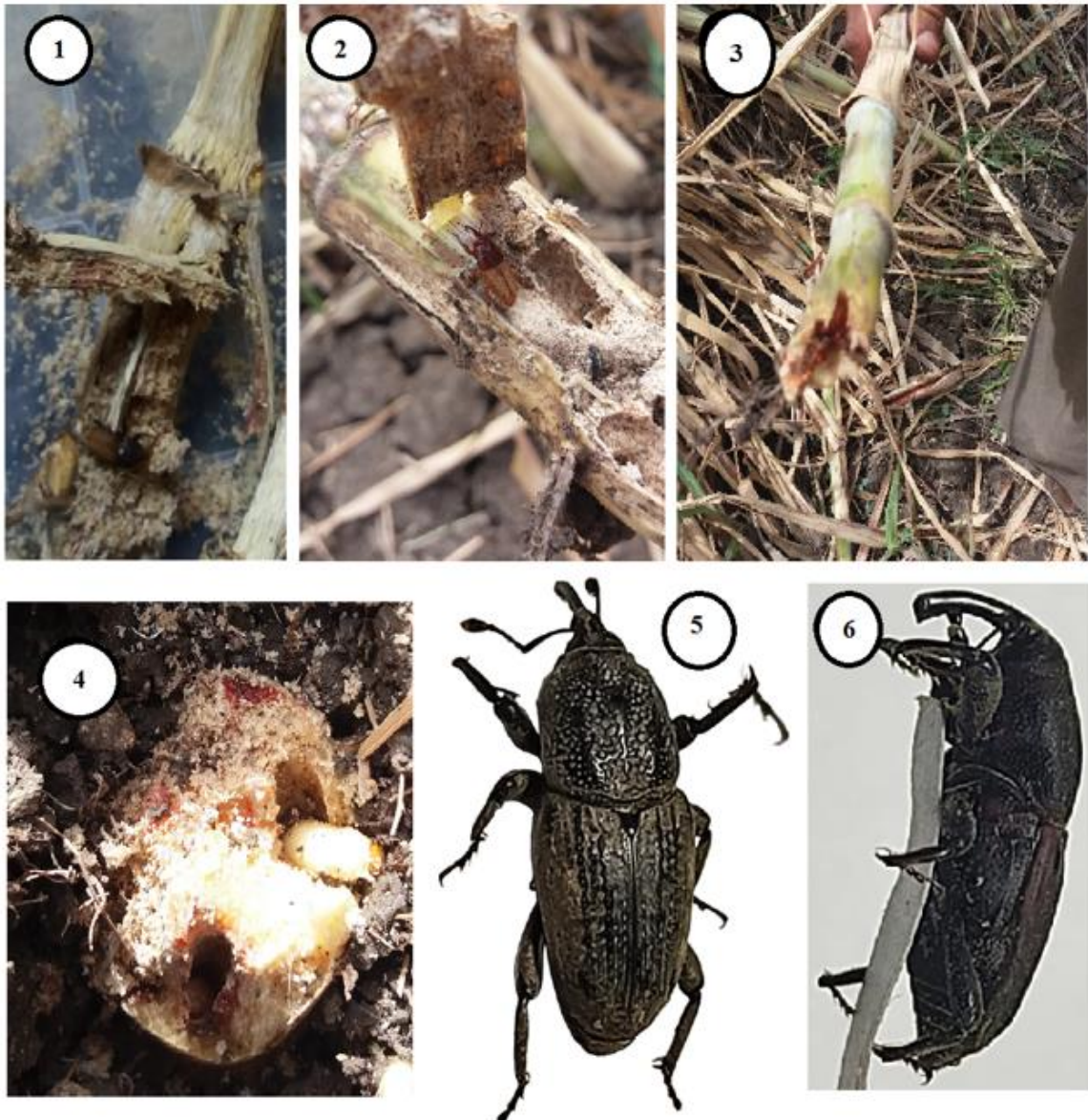
Sphenophorus placidus, Gyllenhal, 1838, in Schoenherr, Genera et species curculionidum, vol. 4, p. 947.

Sphenophorus confusus Gyllenhal, 1838, in Schoenherr, op. cit., vol. 4, p. 944.

Sphenophorus fallax Boheman, 1845, in Schoenherr, op. cit., vol. 8, pt. 2, p. 256.

Type locality: "The United States." Type destroyed.

Neotype locality: Watch Hill, Rhode Island, July 11, 1909 (W. Robinson). Neotype, male, new designation, in the American Museum of Natural History.



Figs. (1-3) Sugarcane crop infested with adult billbugs, **(4)** Larva infested sugarcane, **(5&6)** *Sphenophorus venatus*, **(5)** Dorsal view, **(6)** Lateral view.

Description:

Body, small to medium; black or dark red, bare, or coated; pronotum with three bare vittae, the median enclosing an apical depression, the laterals not reaching the apex; elytra variable, but striae punctures much larger than interval punctures.

Rostrum (from the side) curved, compressed, broader at apex, base with

puncture between eyes and depression of concentrated punctures. Eye reaching below the insertion of the rostrum.

Thoracic lobe present. Pronotum with three feebly or strongly raised, not well-defined, bare strips, the median Y shaped, often disappearing towards the base, enclosing an ill- or well-defined, round subapical depression of dense or merging punctures, the lateral vittae narrow or broad, straight, or oblique, raised in basal one-half or two-thirds only. Scutellum narrower than long, sometimes grooved.

Elytra variable, bare or coated, in all or part, smooth or rugose, third and fifth intervals usually somewhat raised and somewhat wider than other intervals; striae with a large round or oval punctures six to eight times larger than interval punctures and cutting into intervals, making their sides sinuous. Under surface finely or coarsely punctured. Legs, front tibiae with an outer apical angle not prolonged, all tarsi with third segment narrow, longer than wide, below mostly smooth, with sparse hair at sides. Pygidium with tufts of hair at apex at sides.

Comparison:

The closest species to *Sphenophorus venatus* (hunting billbug) is *S. parvulus* (bluegrass billbug) (Huang and Buss, 2013). The hunting billbug is slightly larger than the bluegrass billbug, the pronotum of the adult has uneven punctures and tubercles, marked with a bare Y-like shape enclosed in parentheses (Kuhn, *et al.* 2013). The *Sphenophorus venatus* also has grooves on its elytra, more distinct in the *S. parvulus*. In addition, the life history of the *Sphenophorus venatus* appears to be similar to that of the *S. parvulus*, but hunting billbug adults are nocturnal, and eggs are deposited in or around feeding scratches made by the female on plant stems (Huang and Buss, 2009).

During the field survey, some specimens (belonging to the genus *Sphenophorus*) were found very similar to the *S. venatus* but differ in that the marks on the pronotum are not as distinct as *S. venatus*, they need critical examination (They may be *S. cicatristriatus* or *S. phoeniciensis*).

Geographical Distribution:

Sphenophorus venatus is geographically distributed across the Atlantic and Pacific coasts and the southern US, additionally, it has been reported in Hawaii, Puerto Rico, Mexico, the Bahamas, the Dominican Republic, Martinique, and Japan (Marsden 1979, O'Brien and Wibmer 1982, Hatsukade 1997).

Hosts of Hunting Billbugs:

Timothy hay (*Phleum pratense* L.), Bermuda grass (*Cynodon dactylon* (L.), wheat (*Triticum aestivum* L.), yellow nutsedge (*Cyperus esculentus* L.), corn (*Zea mays* L.), sugarcane (*Saccharum officinarum* L.) (Satterthwait 1931, Woodruff 1966, Oliver 1984). *Sphenophorus venatus* was reported as a pest on orchard grass (*Dactylis glomerata* L.) (Kamm, 1969).

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ARABIC SUMMARY

تسجيل جديد لجنس

(*SPHENOPHORUS* SCHOENHERR, 1838 (COLEOPTERA: CURCULIONIDAE: DRYOPHTHORINAE)

للمرة الأولى من مصر

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2- كلية العلوم جامعة الأزهر فرع النبات- قسم علم الحيوان والحشرات

تعتبر الأنواع المختلفة من السوس التابع لجنس *Sphenophorus* من الآفات الاقتصادية الأساسية و هي أرضية المعيشة حيث تضع بيضها تحت أنسجة سيقان النباتات مسببة أضرارًا للساق والتاج والجذور، مما يتسبب في موت النبات. خلال الدراسة الحالية تم رصد أفراد من السوس في احد حقول قصب السكر بمحافظة قنا بجنوب مصر مختلفة في الشكل عن باقي السوس الشائع و المتواجد بنفس المكان. تم جمع عينات من السوس و إرسالها الي إلى بعض خبراء العالم في فصيلة السوس، وقد اقترحوا إجماعاً أن العينات هي نوع ما ينتمي لجنس *Sphenophorus* (جنس غير مسجل من قبل في مصر ينتمي لفصيلة Curculionidae) لكنهم لم يستطيعوا تأكيد النوع. في العمل الحالي تم إجراء دراسة تصنيفية لتعريف النوع وتأكيد. حيث تم تحميل العينات و فحصها ووصفها تصنيفاً وتصويرها مع أماكن إصاباتها المختلفة علي العائل. كما تم تعريفها باستخدام مفاتيح التصنيف المتاحة الخاصة بفصيلة السوس واجناسه و انواعه ومقارنة الوصف مع ما تم وصفه سابقاً. أكد العمل التصنيفي أن العينات تنتمي إلى *Sphenophorus venatus* Chittenden و هو ما يعتبر أول تسجيل له من مصر (كجنس و كنوع). تساهم هذه النتيجة مع البيانات حول الأهمية الاقتصادية و الضرر والتوزيع والنباتات العائلة في إثراء وتصحيح قوائم الحشرات في مصر والحفاظ على التنوع البيولوجي.