



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2018; 6(2): 2119-2122

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Received: 05-01-2018

Accepted: 06-02-2018

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## Notes on faunistics of *Aaata finchi* Waterhouse (1844) (Coleoptera: Buprestidae) from Pakistan

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### Abstract

The monotypic species *Aaata finchi* Waterhouse (1844) is redescribed from Nushki, Balochistan, Pakistan. Male and female genitalia, habitat and zoogeography also discussed with illustration. This species confined specific month in mid of July with consistency of two years on muddy desert habitat which have xerophytic plants of small bushes, runners and Tamarix plants. This species never described with male genitalia even habitat was unknown; therefore it is first attempt to described it with various aspects.

**Keywords:** buprestidae, Julodinae, *Aaata finchi*, faunistics, habitat, Pakistan

### 1. Introduction

Nushki is the small city of Balochistan Province, Pakistan and hotspot of biodiversity because of sub-tropical ecozone with extended deserts of sand dunes, xerophytes variation and a marsh lake in zanginawar which is near to union council, Dak<sup>[2]</sup>. The city is not well established and not such agriculture fields, however, hard and dry mountains occupy the city. The biota of the Nushki is entirely neglected. Unlike Thar Desert, Sindh, the area of Jamaldini, Dak, Zanginawar and Anam Bostan are full landscapes of sand dunes with many runner species of plants, *Tamarix* species rare here, only *T. auriculata* present in Zanginawar, which was the collecting point<sup>[2]</sup>. The fauna of insects could be overlapped because Anam Bostan is the border of Afghanistan and Pakistan (personal visit). The family Buprestidae is one of the distinct groups of beetles with metallic colours. This family contains six subfamilies, in which Julodinae is largest subfamily with their huge size<sup>[4]</sup>. The subfamily Julodinae Lacordaire, 1857 consists of six genera viz., *Amblysterna* Saunders, 1871; *Julodis* Eschscholtz, 1829; *Julodella* Semenov-Tian-Shanskij 1893; *Neojulodis* Kereemans, 1902; *Sternocera* Eschscholtz, 1829 and *Aaata* Semenov-Tian-Shanskij, 1906. The species *Aaata finchi* was originally described by Waterhouse (1844) from Karachi under the genus *Julodis*, later Semenov<sup>[7]</sup> transfer the species in the genus *Aaata*. Holm<sup>[4]</sup> revised the tribe Julodini with six genera described and keyed out. He also discussed apomorphies of genera and illustrated with their zoogeography and host plants. He did not describe male of *Aaata finchi* because of unavailability and just focused all characters on female<sup>[4]</sup>. In Pakistan, the systematics of Buprestidae entirely neglected, however some taxonomic work were carried out but it was fraction of work. There are two inventories but the species *Aaata finchi* has not recorded<sup>[3]</sup>.<sup>[1]</sup> The flora of Karachi has rich with many variety of bushes and shrubs in past. In last century, it was well known for hunting of large animals but after increase of human population, the habitats of animals destroyed and after 80 years, the forest become diminished. The chance of species *Aaata finchi* Waterhouse<sup>[8]</sup> likely to present in past but it is now restricted to Nushki, Balochistan, border areas of Afghanistan and Pakistan. The members of Julodini with distinction of *Julodis* widely distributed in Sindh and Balochistan provinces (personal observation). We provide information of members of Julodinae in two provinces which show great distance after long intermediate channel and it bears *Julodis* species which rather smaller to *Aaata finchi* as well as plant discrimination.

### 2. Materials and Methods

The specimens of *Aaata finchi* were emerged in July beginning to mid of month. The area of Nushki, Dak (Fig.1) contains mounds of mud desert which grow small bushes of xerophyte plants. In 2016 and 2017, specimens were obtained in the same month but not abundantly

found, just rare and caught by fly. The specimens collected by hand picking method and sweeping net on bushes of *Tamarix* plants on day time. After collection, specimens were killed in ethanol and then pin mounted with labeled data. The

species identify by key of Julodini<sup>[4]</sup> and also compared it with specimen at loan basis, housed in the museum of Islamabad, NARC. The species was housed in ZMFKP (Zoological Museum FUUAST Karachi Pakistan).

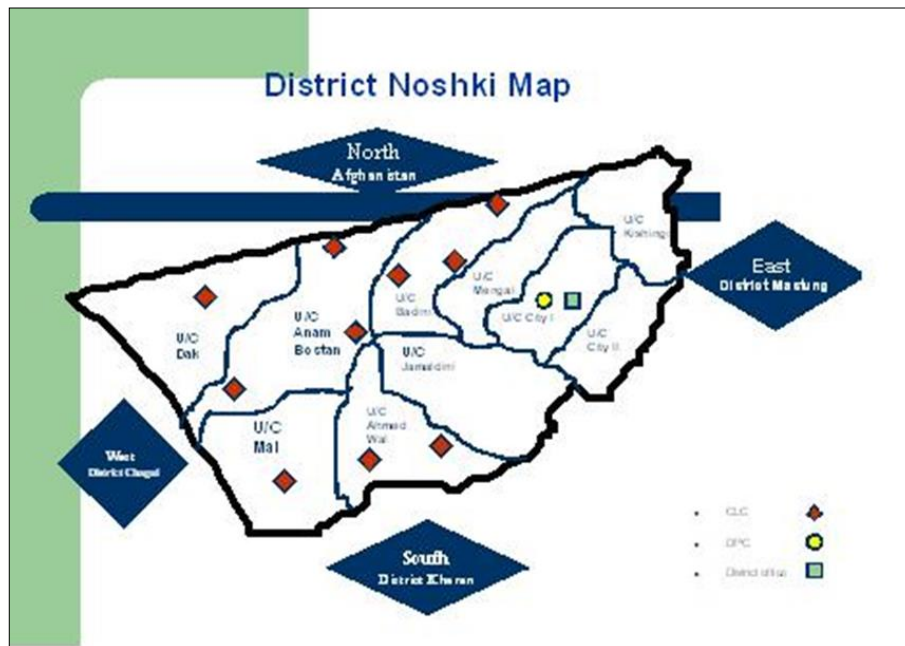


Fig 1: Map of nushki with districts, union councils

### 3. Systematic account

Family Buprestidae Leach, 1815

Subfamily Julodinae Lacordaire, 1857

Genus *Aaata* Semenov-Tian-Shanskij, 1906

*Aaata finchi* Waterhouse (1844)

(Figs: male, a, b; female, a, c)

#### 3(1). Measurement

3ex, male length (mean) 59mm (56mm-61mm) width, 20.8mm (19mm-22mm)

5ex, female length (mean) 70.4mm (67mm-72mm), width, 24.6mm (23mm-26mm).

#### 3(2). Head

Head black, covered with dense pile, frons narrow, posteriorly raised; eyes brown, slightly convex; clypeus short, well-marked with two denticles, medially notched scarcely. Antennae (b, c) serrate, scape elongate, gradually thickened distally, with pale white pile, pedicel small, sub-quadrate, funicle with 3<sup>rd</sup> and 4<sup>th</sup> segment cylindrical, 4<sup>th</sup> segment slightly longer than 3<sup>rd</sup> segment, rest segments serrate, last segment narrowly acuminate, deflected before apex.

#### 3(3). Thorax

Pronotum large, bell-shaped, depressed, chocolate brown, covered with dense pile, lateral margin rounded, disc with well-marked irregular large patches medially, smaller laterally, posterior margin bisinuate; elytra more elongated, broad at base, sinuate before middle, slightly narrowed posteriorly, apices with three spines laterally, striae margins obsolete, demarcated by sculpture derived from apex with four lines represents striae margin, large series of connected small brown patches between them, covered with dense pale piles.

The female specimen rather big and broad than male specimen. The sculpture of pronotum and colour more dark

and prominent than male specimen. The colour of pronotum sculpture in female was piceous brown and broad fasciae while chocolate brown colour and smaller fasciae on males. The metasternum also piceous brown and broader in female than chocolate brown and less broad in male metasternum. The females were found with variable in length noted in measurement.

#### 3(4). Male genitalia: (d-k)

Aedeagus (d) with tegmen well sclerotized, broad, large, longer than parameres, apex truncated scarce, penis (e) ventrally sheathed; parameres stout, broad, shiny, apically rounded, with distinct punctures throughout surface, jointly at base with tegmen then open apically at dorsal. Two pale yellowish appendages at base ventrally, slightly fused at base, broadly triangular-shaped.

Two male genitalia shown (f-k) with dorsal, ventral in variation of colour, basal portion dorsal and ventral. The aedeagus of one specimen stretched during dissection however, the parameres fused together with tegment were permanent characteristics. The size of penis as membranous delicate structure vary intraspecifically in *Julodis* species of Africa<sup>[5]</sup>. The terminology of male genitalia followed by Lindroth & Palmkn<sup>[6]</sup>.

#### 3(5). Female genitalia: (d-f)

The female genitalia of Julodinae are not significantly for the identification of species<sup>[5]</sup>. The structure of genitalia consists of mostly membranous with elongated sclerotized bands, apically distinct with two long, broad prongs.

### 4. Material examined

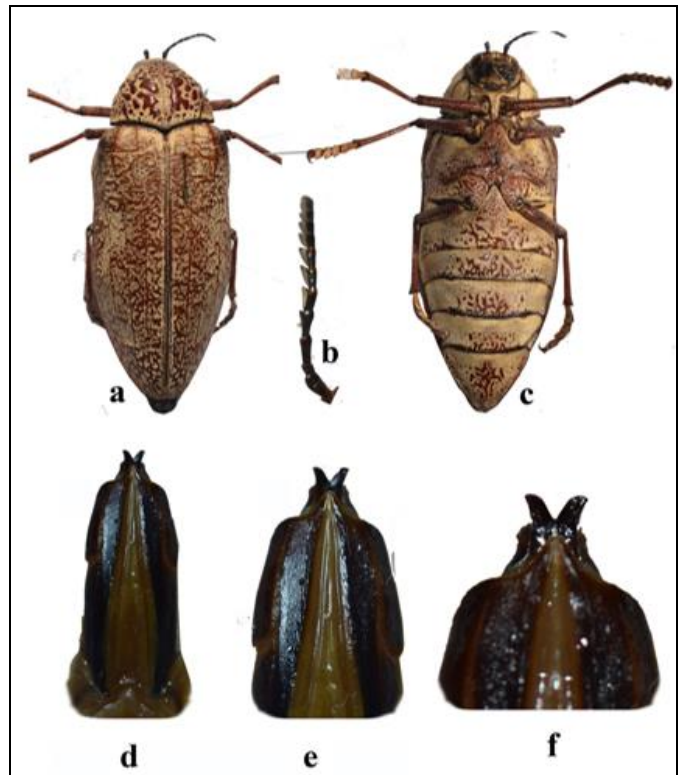
Pakistan, Balochistan Province, District Nushki, Tehsil Zanginawar, 2males, 2 females, 16.vii.2016, coll. Shuja Jan. 1 male, 3 females, 7.vii.2017, coll. Shuja Jan. 1 female, NARC (National Agriculture Research Centre) without data.

**5. Biological Note**

The species *Aaata finchi* has peculiar and specific habitat. The area of Zanginawar is near to Dak, almost desert area along big sand dunes mounds with scattered plants (IA) of *Tamarix auriculata* and some runners also has permanent brackish water lake. The species collected from *Tamarix auriculata* in short period. Holm (1979) described biology of *Sternocera* as Savannah of Africa with species of *Acacia*, but in the area of Nushki, the *Acacia* absent and *Tamarix auriculata* with variable sized. He agreed the biology of *Sternocera* for *Aaata finchi*, but it should be noted that this species is most exhibit of endemism rather than *Sternocera* and *Julodis* and also peculiar with their habitat.

**6. Discussion**

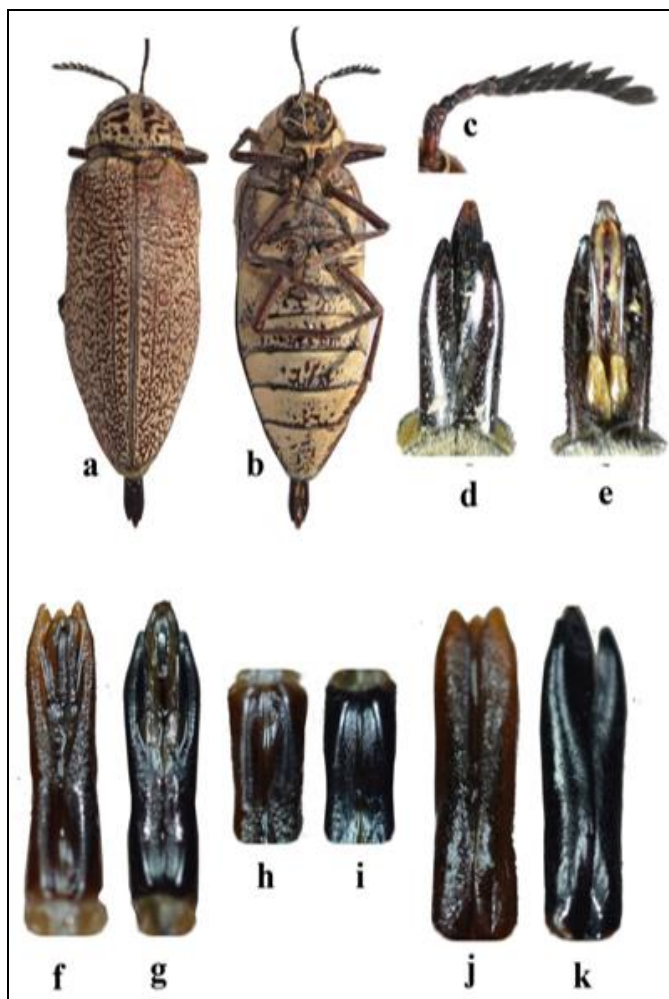
The previous work on Julodini restricted to Africa [4], [5], however Holm [4] faced difficulty to told occurrence of *Aaata finchi* but he said it occur between junction of Ancient Africa and Eurasian countries. The presence of this species from Karachi by Waterhouse [8] indicated the desert fauna of Africa and Palaearctic should be similar therefore the occurrence of this species was not surprising from that time but recent time it consistently emerged from Nushki since two years. The species description by Holm [4] was excellent by means of characters showed by figures but he did not find male specimen and present study provided not only characters through figures but also male and female habitus, genitalia for the first time in the literature.



**Plate 2:** a. female habitus dorsal b. antennae c. female habitus ventral d-f. different views of female genitalia with apical prongs



**Plate 3:** Different habitat of species *Aaata finchi* in Nushki, Balochistan, *Tamarix auriculata*, extended vegetation in sand dunes



**Plate 1:** *Aaata finchi*, a. male habitus dorsal b. ventral view c. antenna d. aedeagus dorsal e. aedeagus ventral f,g. ventral of aedeagus of two males h, i. base of parameres of two males j,k. dorsal of aedeagus of two males

**7. Conclusion**

The presence of *Aaata finchi* from Nushki, exhibit more chance of interesting species by keen study of that areas. Occurrence of species reveals potential endemism in spite of the geography of that species is purely Palaearctic with semi-desert nature which coincide Afrotropical desert but the species never been reported from there and other genus *Sternocera* have found there. It is first attempted to describe male and female habitus with their genitalia, geographical occurrence and biology. Discoveries like this make an important habitat threats, which need to be more precise collection of remote areas and globally support of this type of endemic nature.

**8. Acknowledgement**

Author indebted to Shuja Jan, who is wildlife manager in Nushki, Balochistan for the specimen's collection and provides habitat pictures. We also thanks to Dr. Maurizio Gigli (Italy) for the valuable suggestions and Mark

Volkovitsh (Russia) for provide pertinent literature.

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