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Notes on the genus *Apomecyna* Dejean, 1821 (Coleoptera: Cerambycidae) with description of two new species from Pakistan

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Four species of the genus *Apomecyna* Dejean are revised from Pakistan. All these species are (re-) described and illustrated: *A. balochicus* sp. nov. Ahmed & Barševskis, 2023, *A. fallaciosa* Breuning, 1938, *A. minor* sp. nov. Ahmed & Barševskis and *A. saltator* Fabricius, 1781 Key to the species and the distribution map are also provided.

Key words: Coleoptera, Cerambycidae, new species, distribution, Pakistan.

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INTRODUCTION

Löbl & Smetana (2010) provided the list of 20 species and subspecies of the genus *Apomecyna* Dejean, 1821, known from the Palaearctic region. Four species and one subspecies are recognized for Pakistan: *A. fallaciosa* Breuning, 1938, *A. histrio histrio* Fabricius, 1792, *A. lameerei* Pic, 1895, *A. leucosticta* Hope, 1831, and *A. saltator* Fabricius, 1781.

The study of Cerambycidae in Pakistan has a long history, including confusions, lack of specimen validation, and diversity mismanagement. A checklist by Hashmi & Tashfeen (1992) contains 48 species from Pakistan, housed in various institutional museums. However, neither *Apomecyna fallaciosa* nor *A. perrigera* were not found in these collections. A similar lack of representation was noted in Chaudhry et al. (1966), the study on economically significant insects, which listed 22 longhorn beetle species without mentioning any *Apomecyna* species. More recently, Rapuzzi et al. (2019) listed 56 species (mostly based on literature), including new records of 15

species and only one *Apomecyna* (*A. saltator* Fabricius) from Pakistan.
A key challenge in *Apomecyna* taxonomy is the reliance on outdated morphological descriptions, particularly those involving antennal segment lengths. Breuning (1971) distinguished *A. histrio* based on the length of the 3rd and 4th antennal segments being longer than the 5th and subsequent segments combined. Biswas and Basak (1992) similarly used this character, alongside elytral markings, for species differentiation. However, the new species described in this study challenge this antennal segmentation character, as their 3rd and 4th segments are shorter than the 5th and subsequent segments combined.

Currently, no comprehensive taxonomic key exists for the genus *Apomecyna* which cover not only superficial characters but also bear genitalial characters for the separation of the species. The absence of *A. perrigera* in Löbl & Smetana's (2010) catalogue raises questions, while Tavakilian & Chevillotte's (2019) listing of 115 Cerambycidae species from Pakistan, including four *Apomecyna* species (*A. fallaciosa*, *A. histrio*, *A. lameerei*, and *A. saltator*), still omits *A. leucosticta* Hope, which has been recorded from Pakistan in previous works.

This study presents redescriptions of two known species, *A. fallaciosa* Breuning and *A. saltator* Fabricius, and provided descriptions of two new species: *A. minor* sp. n. and *A. balochicus* sp. n. The present study incorporate both external and internal morphological features (genitalic characters), which have not been previously studied.

MATERIAL AND METHODS

Specimens were collected by hand on lights in hotel, way to Balochistan highway. The *A. saltator* Fabricius and *A. fallaciosa* Breuning collected on light at Thar Desert Sindh Province. New species, *A. minor* sp. nov. and *A.balochicus* sp. nov. were collected from Bela, Balochistan on the light. Specimens were killed in 90% ethanol then mounted.

Morphological characters and dissected aedeagi were studied with a stereomicroscope model SZM 405, the Photograph were taken with a SZM 405, with a Nikon camera model D-7000 and an AF-S Micro Lens 60mm f/2.8.

All studied specimens including type material are deposited in the Zoological Museum of Federal Urdu University, Karachi, Pakistan (ZMFUUP).

The pictures of the body of the type specimens from Copenhagen Museum (ZMUC) of four species of *Apomecyna* (Plate.1) is helpful for the comparison.

RESULTS

***Ampomecyna minor* sp. nov.**
(Fig.1)

Type locality. Pakistan, Balochistan Province, Bela, District. Lasbela

Type specimen. HOLOTYPE male, pinned, Original label: "Pakistan, Balochistan Province, Bela, District Lasbela, 12.vi.2022, Collector, Zubair Ahmed", HOLOTYPE/ *Apomecyna minor*/ Ahmed and Barševskis [handwritten label] (FUUZM). 26° 13' 37.56" N, 66° 18' 39.96" E.

Description. Measurement: body length 6.00 mm

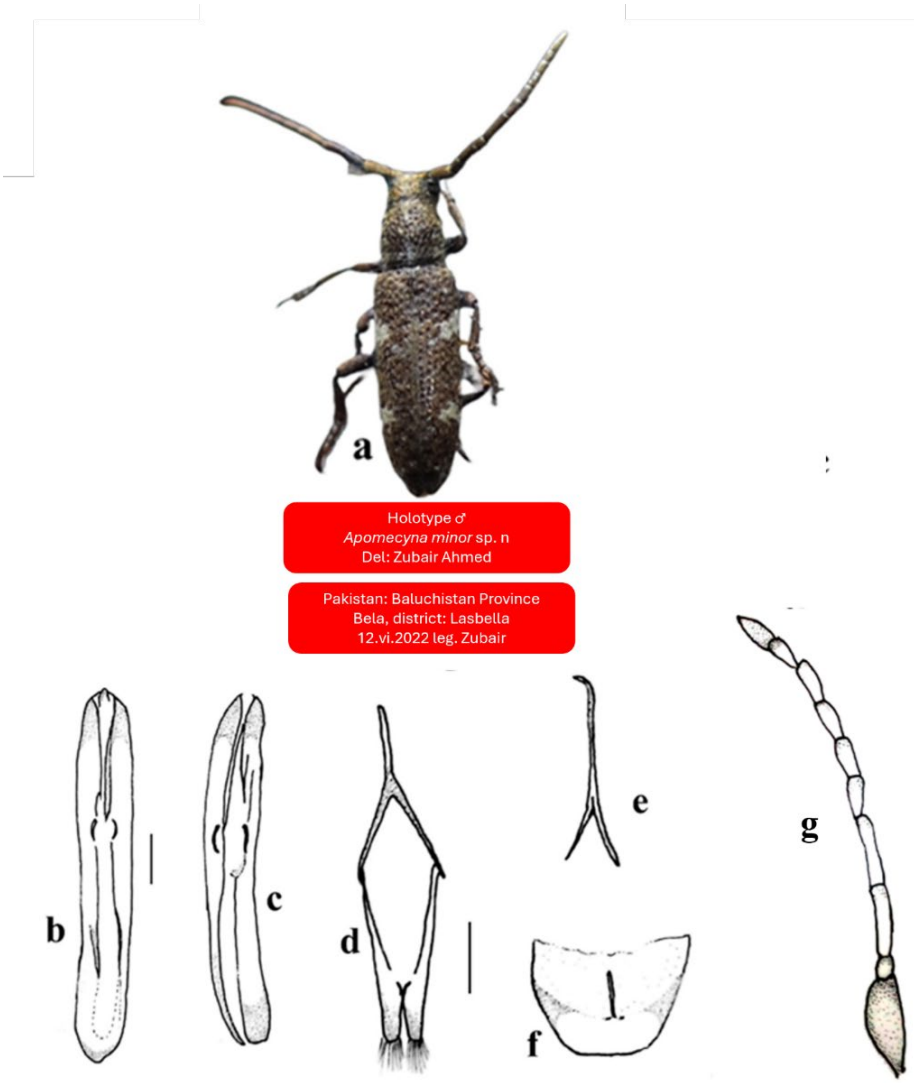

Fig.1. *Apomecyna minor* sp. nov. male, a) dorsal habitus b,c) aedeagus ventral, dorsal, d) tegmen, e) sternite IX, f) basal plate or sternite VIII, g) antenna.

Body elongate, subcylindrical, grey, flattened dorsally. Head depressed in anterior portion, with thin median line, vertex with coarse punctures. Antenna with elongate basal segment, broad, antennomere 2 small, 3 longer (0.9 mm) than slender antennomere 4 (0.7 mm). Maxillary palp 3 segmented, apical segment longer.

Pronotum grey, subcylindrical, almost quadrate, longer than broad scarcely, anterior margin straight, lateral margin semi rounded, posterior margin truncate, anterior and posterior angles obsolete.

Scutellum small, slightly lobe-like, rounded, elytra parallel, narrow, apices triangular.

Elytra dark brown, marked with grey hairs, slightly flattened dorsally, with contiguous and coarse punctures in basal portion, covered with dense, sparse hairs, each elytron with two white patches on mediolateralportions.

Prosternal process narrow, elongate, broad, distinctly wider in basal part. Mesosternal process narrowly triangular, acuminate at apex; metasternum with groove in front of coxal cavities at middle, ventrites smooth, with sparse hairs, fore tibia sinuate internally, narrower proximally and becoming thickened distally.

Male genitalia: Fig. 1 (b – f).
Differential diagnosis. *Apomecyna minor* sp. nov. can be distinguished from related *A. histrio* by the smaller body (the body length of *A. histrio* starting from 7.00 mm; Biswas & Basak 1992). Additionally, both species have sister relationship like elytra dark brown; antennae hardly extending up to middle of elytra but separated by elytra with pale reddish brown hairs, elytra obliquely truncated apically; 3rd and 4th antennal segments apically and rest of the segments dark brown, 3rd and 4th segments combined length longer than 5th and rest of segments combined pronotum with basal gray small patch in *A. histrio* while elytra with greyish hairs, elytra conically and rounded apex; all antennal segments dark brown, 3rd and 4th segments combined shorter than 5th and rest of segments combined and pronotum with all margins with grey narrow patch in *A. minor* sp.n.

Etymology. *Apomecyna minor* – The name of the new species alludes to the small body.

***Apomecyna balochicus* sp. nov.**
(Fig.2)

Type locality. Pakistan, Balochistan Province, Bela, District. Lasbela
Type specimen.: Holotype male, pinned, Original label: "Pakistan, Balochistan Province, Bela, District Lasbela, 12.vi.2022, Collector, Zubair Ahmed", "HOLOTYPE/ *Apomecyna balochicus*/ Ahmed and Barševskis" [handwritten label] (FUUZM). 26° 13' 37.56" N, 66° 18' 39.96

Description. Measurement: body length12.00 mm.

Coloration: Body black, covered with grey to light grey patches and pubescence.

Body elongate, subcylindrical, slightly flattened, grey. Head depressed between eyes with a median line, clypeus with sinuate anterior margin. Antennal tubercles projected. Basal antennomere narrow proximally, gradually broadened distally, antennomere 2 small, slender, antennomere 3 slightly curved, longer (1.3mm) than 4th segment (1.0mm), apical antennomere small, bent at upper side, conically narrowed.

Pronotum with anterior margin narrower than posterior margin, feeble explanate apically, lateral margin oblique anterior, then rounded, deflected at base, posteriolateral margins angulate at both sides, disc convex, covered with dense hairs, coarse punctations, median line white, scutellum triangularly rounded with two bunch of pale white hairs lobately oblique.

Elytra with shoulders straight, apico-lateral margin feebly explanate, strial margins with coarse punctures, sparsely dense covered by dingy brown pubescence, each elytron with two pairs gray patches mediolateral, premedian patch oblique, cylindrical, postmedian patch with distinct three broad dot like patch, apices conically produced. Mesosternal process broad, elongate, sinuate at base. Metasternum divided at base, with groove. 1st ventrite broadly triangular, elongate, ventrites black, dense, with sparse

setation, lateral margins with series of white dense patches of hairs, with some coarse punctures. Legs with fore femora shorter than meso- and metafemora, tibiae short, slender, broadened at apex.

Male genitalia: Fig. 2 (c – g).

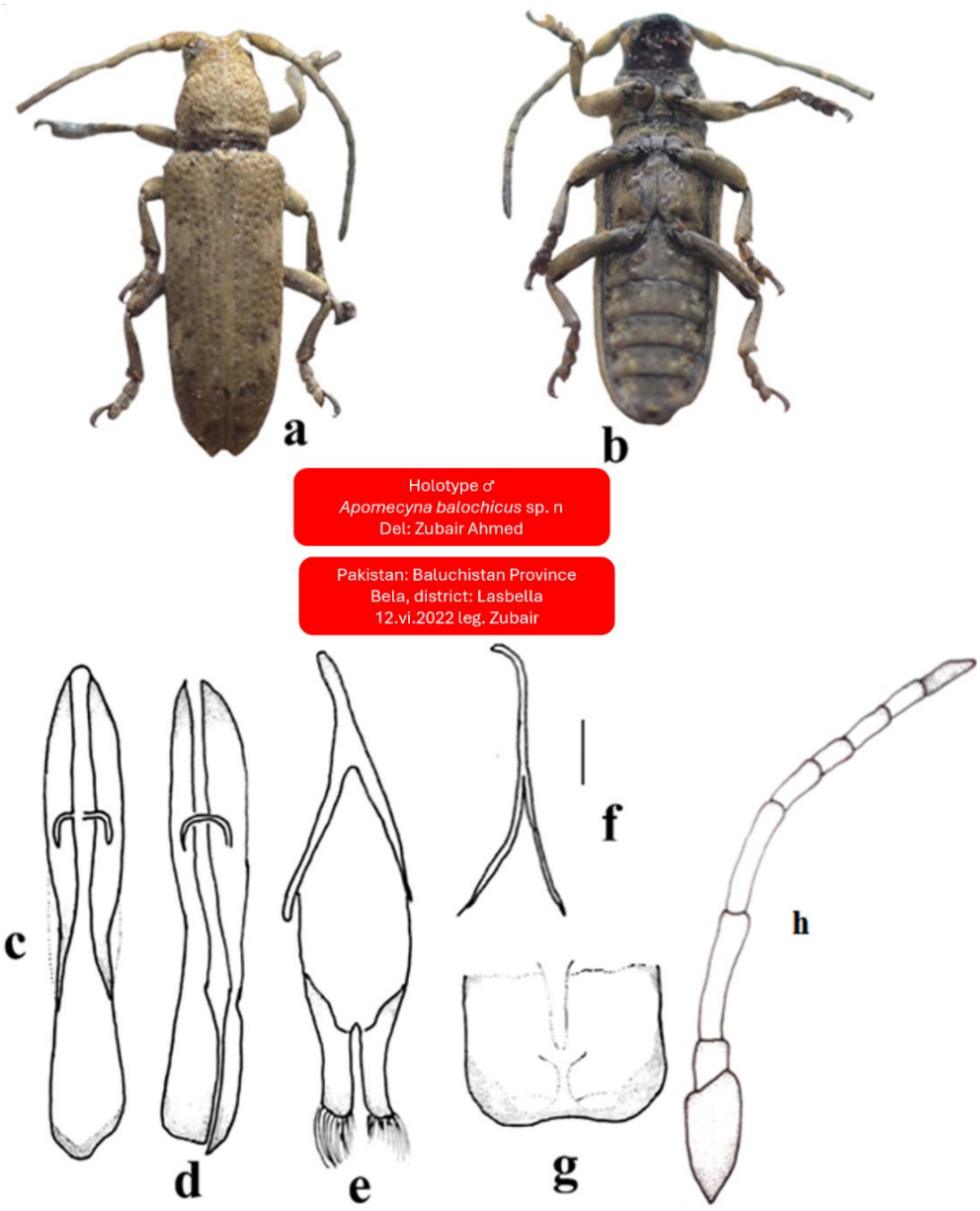

Fig.2. *Apomecyna balochicus* sp.n. a) male habitus dorsal, b) habitus ventral, c,d) aedeagus dorsal, ventral, e) tegmen, f) sternite IX, g) basal plate or tergite VIII, h) antenna.

Differential diagnosis: *Apomecyna balochicus* sp.nov. is similar to *A. fallaciosa* Breuning by the body appearance, but the entire body punctation is not deep and coarse than that in *A. fallaciosa*. Additionally, pronotum with a median white patch line; scutellum with buch of pale pubescence; elytral patches mediolateral and away from sutural margin; aedeagus with parameres shorter than median lobe, position of median hanging band-like sclerites is right angle, connected; basal plate quadrate shaped, as long as broad; lateral margin of ventrites with pale yellow spotted marked in *A. balochicus* sp.n while pronotum without a median patch line; scutellum have not such pubescence; elytral patches dorso-lateral and near to sutural margin; aedeagus with parameres slightly longer than median lobe, basal plate wider than long, position of median hanging band-like sclerites curved, separate; lateral margins of ventrites without such spotted mark in *A. fallaciosa*.

Etymology: The species name is derived from the name of the province of Baluchistan where it was found.

***Apomecyna fallaciosa* Breuning, 1938 (Fig.3)**

Material examined: 2♂, 1♀, Umerkot, Tharparkar, Sindh Province, Pakistan, 11.viii.2022.leg; Zubair. 25° 22' 0" North, 69° 44' 0" East.

Measurement: body length 10.00 mm

Coloration: body black with dense grey hairs, elytra dark brown.

Head small, vertex transversely convex, frons depressed at middle, frons with a median line, clypeus, short, broad, anterior margin straight, covered with coarse punctures and white hairs, labrum short, black, transverse, mandibles short, broad, basal antennomere narrower at base, broad entire, antennomere 2 small, slender, antennomere 3 slightly longer (1.00 mm) than 4 (0.8 mm), apical antennomere small, finger-like, covered with white dense hairs.

Pronotum almost quadrate, anterior margin slightly narrower than posterior margin, anterior margin with smooth band, lateral margin sinuate at middle, disc with broad and coarse punctures; scutellum short, lobate; elytral shoulders distinct, lateral margins parallel, apices obliquely conical, each elytron with light patches of yellow hairs at humeri, middle and apices, strial punctures coarsely elongate; prosternum with very narrow process, expanded at base, mesosternal process elongate, scarcely broad with median sulcation; legs short, slender, tarsi 3 segmented; ventrites with coarse, deep scattered punctures, with white dense piles, pygidium transverse, anteriorly rounded, covered with dense white hairs, bunch of long hairs raised at middle.

Male genitalia: figure 3 (e,f,g) Aedeagus with median lobe invisible, parameres elongate, blunt apex, median sclerites of endophallus short, feebly curve down, tegmen with apophysis elongate. Basal plate transverse, broader than long, base angulate.

Female genitalia: figure 3 (b,c) segment VIII pear shaped, segment IX small, expanded above.

Note: The species is known from Pakistan and Uttar Pradesh (Löbl & Smetana, 2010).

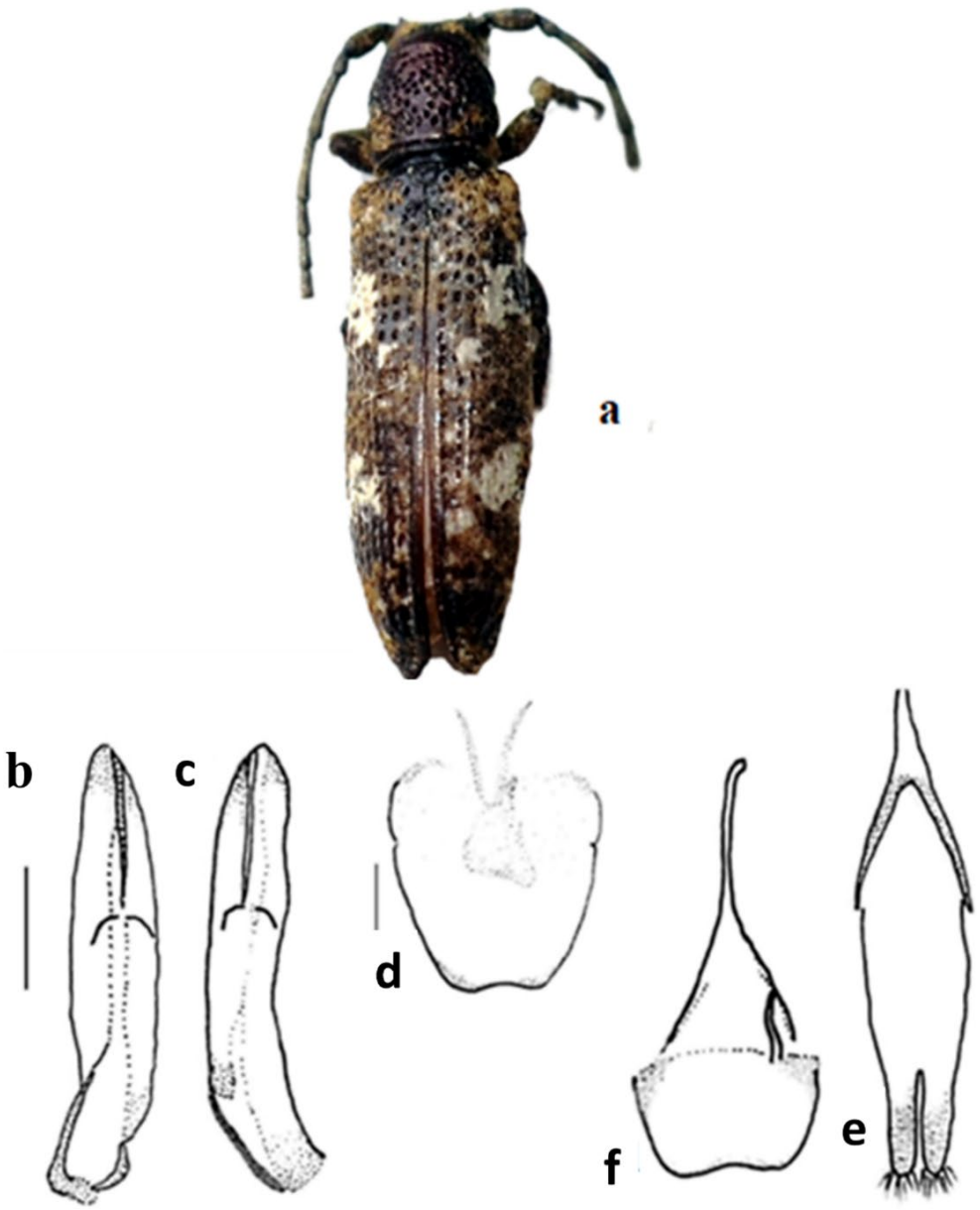

Fig.3. *Apomecyna fallaciosa* Breuning, a) male habitus, b,c) male genitalia d) basal plate, e) tegmen, f) sternite IX

***Apomecyna saltator* Fabricius (Fig.4)**

Material examined: 2 ♀, Umerkot, Tharparkar, Sindh Province, Pakistan. 20.Vii.2019, leg; Zubair. 25° 22' 0" North, 69° 44' 0" East.

Measurement: body length 14.5 mm
Coloration: body black, covered with dull brown to white hairs.

Head transverse, small, vertex coarsely punctate with white dense hairs, frons with deep line, clypeus short, broad, labrum extended, plate like, with truncate apex, maxillary palpomere 3 segmented, antennal tubercle raised. Basal antennomere with long and broad, antennomere 2 short and slender, antennomere 3 longer than antennomere 4.

Pronotum scarcely longer than broad, disc convex, with dense coarse elongate ridges and punctures, median part covered with white hairs, lateral margin rounded at middle, deflected at base; elytral shoulders well projected, lateral margins parallel, apices truncated, each elytron with premedian white patch oblique, broad, not close to sutural margin, second median white patch triangularly produced, near to sutural margin, third narrow line of white patch diagonal before apices, surface with coarse punctures and brown to white sparse dense hairs; legs black, covered with brown to white spotted hairs; sternum black, covered with brown to white spotted hairs.

Female genitalia: Spermathecal bulb slightly swollen, extended tube slender, speculum gastrale narrow, elongate, feebly curved before apex.

Note: The species is known from Pakistan (Löbl & Smetana, 2010).

Fig.4. *Apomecyna saltator* Fabricius. a) Female habitus, b) female spicule with membranous bulb.

Key to species of *Apomecyna* of Pakistan

1. Antennomeres 3-4 shorter than remaining segments……..…..2
- Antennomeres 3-4 longer than remaining segments…….*A. histrio* (Fabricius)

2. Body small, 6.0 mm; elytra dark brown with distinct short, narrow, transverse, 2 pairs white patches; aedeagus with median lobe raised than parameres, endophallus sclerites elongate, scarcely curved….. *A.minor* sp.nov.
- Body distinctly more than 6.0 mm…….……...3

3. Pronotum with narrow ochraceous yellow longitudinal middle band.....……*A.leucosticta* (Hope)
- Pronotum without band……..……..4

4. Body length 12.0 mm; body width 3.9; body black with gray to brown dense hairs with greyish to light brown elytral patches; lateral margins of ventrites bears pale triabgular spots; aedeagus with endophallus sclerites hang in middle, connected, make half loop……...……*A. balochicus* sp. nov.
- Aedeagus with median struts without half loop; Body black with scarce white to brown hairs somewhere ……...5

5. Body length 14.5 mm; width of the body 4.00 mm; elytral apices truncated; pronotum with a median black spot……..……*A. saltator* Fabricius
- Body length 10.00 mm; width of the body 2.2 mm; elytral apices triangular with rounded apex and scarcely raised; pronotum without black spot at middle……...*A. fallaciosa* .Breuning

DISCUSSION

Pakistan has vast desert areas in the Punjab and Sindh provinces, along with some arid or semi-arid regions in KPK, Balochistan, and Gilgit-Baltistan (GB). The Saharan belt extends through Pakistan, Afghanistan, Iran, and India, where species tend to overlap. However, due to the large geographical differences, including mountains and deserts, species may vary or change across these areas. The latitude of Sindh and Balochistan differs greatly from the higher altitude regions of Pakistan, which also affects species distribution. The *Apomecyna* species have received little attention in Pakistan, despite these diverse environments.

An annual survey in the deserts of Sindh collected samples of *A. fallaciosa* Breuning and *A. saltator* Fabricius, which were found near lights. The two new species described in this study were also collected onfrom the lights, during a trip near Quetta, Balochistan, in the Bela region. This area is known for its abundance of wild spiny trees, and these species were found near small restaurants where lights attracted them.

Upon examining the new species, we found that the existing identification keys by Breuning (1971) and Biswas and Basak (1992) do not account for certain key morphological features. These keys rely solely on morphological characters, without providing any data about genitalia. Both new species share some features, such as paired elytral patches, and shorter antennal segments 3-4 in comparison with antennomere 5 and remaining segments. The space between the antennal tubercles is angled. However, significant differences allowed us to identify them as distinct species. For instance, the body length of each species is almost double that of the other. The body width, measured from the middle of the elytra, are also differs.

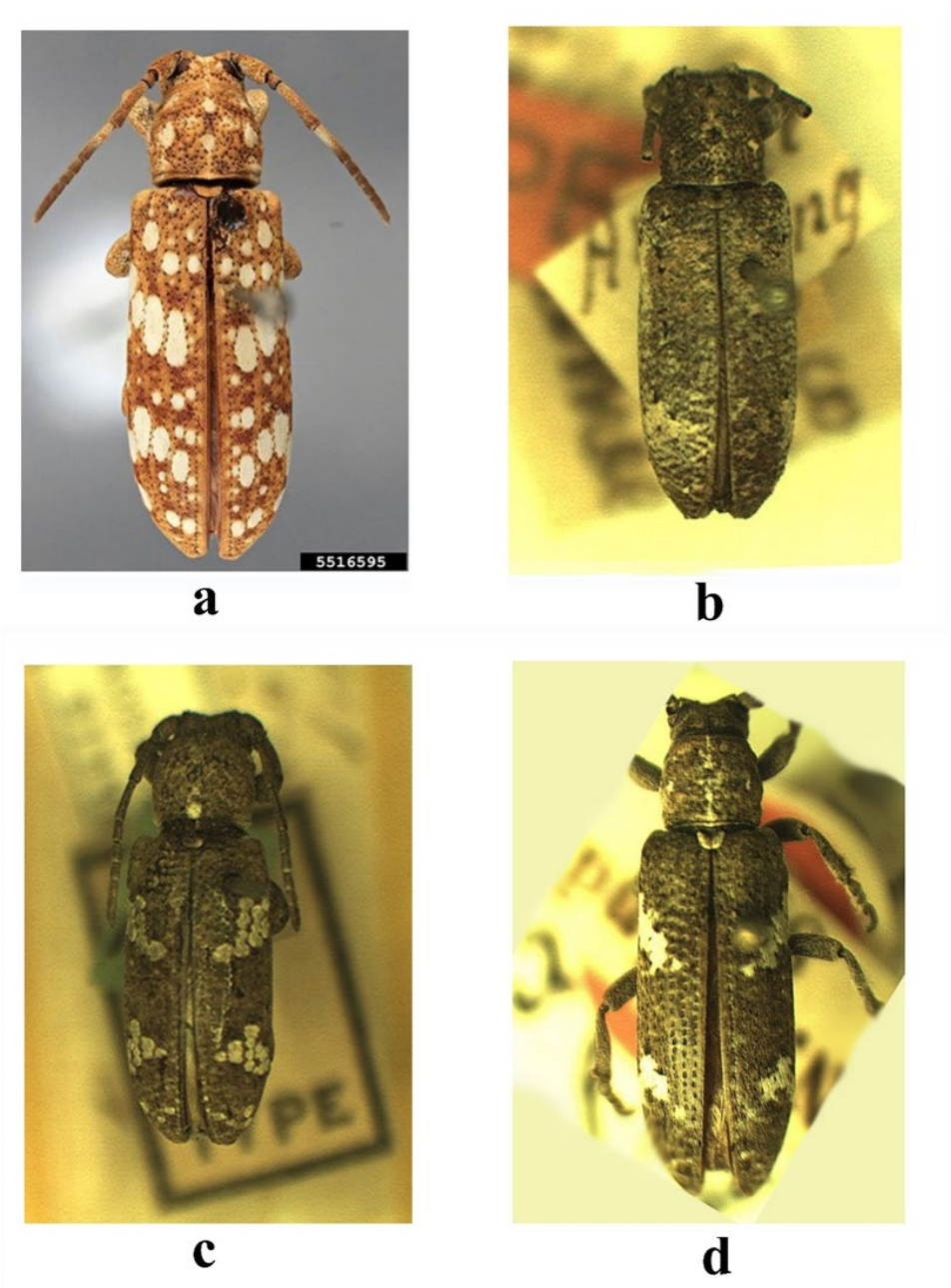

Plate 1: *A. histrio*, syntype b) *A. lameeri*, holotype c) *A. saltator*, holotype d) *A. fallaciosa*, holotype.

The pronotum of *A. balochicus* sp. nov. having a median elongated white line, which is different in *A. leucosticta*, the line of which becomes broad at the base. This white line is absent in *A. minor* sp. nov.. *A. balochicus* sp. nov. has dense gray hairs covering its body, whereas *A. minor* sp. nov. has dense brown and white hairs concentrated in the elytral striae. The aedeagus is similar in both species but varies in length. The sclerites of endophallus as shown in Figures 1 and 2, are also differ, along with tegmen apexes. The basal plate in *A. balochicus* sp. nov. is broadly squared (Figure 2), while in A. minor it is broadly rounded (Figure 1).

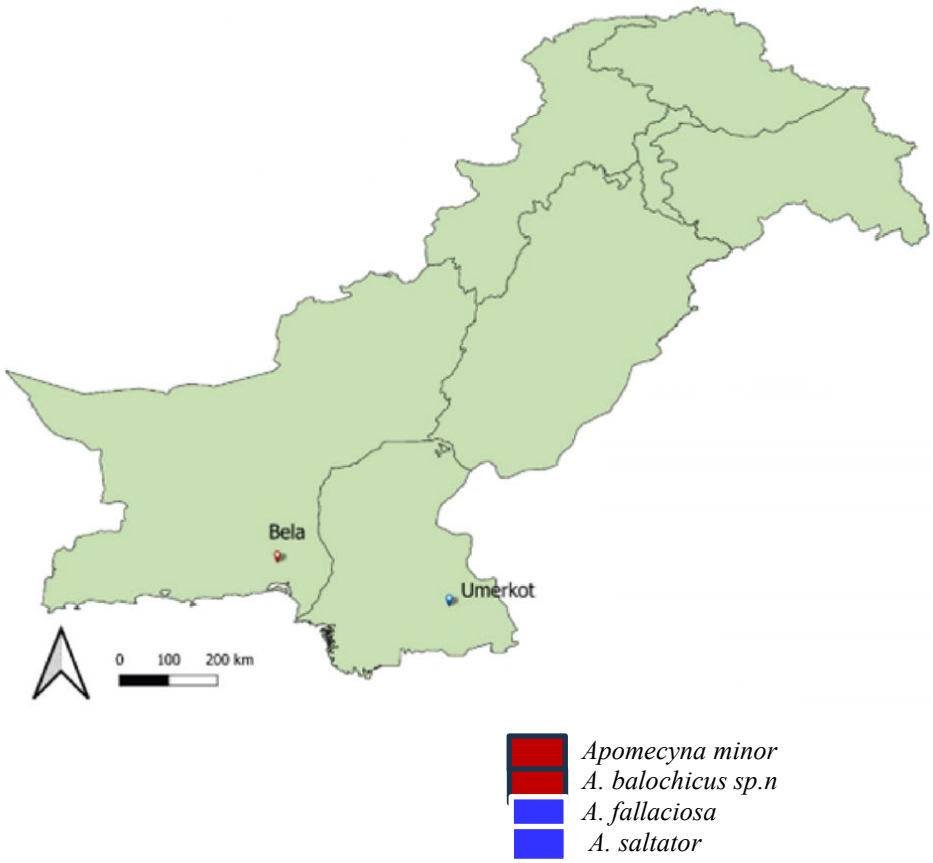

Figure 5. Distribution map of species of *Apomecyna* Dejean

It's likely that more new species could be discovered in the Balochistan belt, but the region is remote, and political or security situations make it difficult to access. In contrast, the Thar Desert is more accessible, and overnight surveys are possible, though the vast size and the distance between living areas make it challenging to cover the entire desert in one night (Figure 5).

These discoveries, along with the threats to natural habitats worldwide, highlight the need for detailed field studies and surveys in Pakistan. To properly document biodiversity, it's essential to collect new

specimens and thoroughly catalog the ones we already have. The results of these faunistic surveys will be shared with academic researchers, Pakistani students at all educational levels, government agencies, natural resource managers, and amateur naturalists. Collaborative projects like this, along with building specimen collections, improving databases, and creating partnerships for biodiversity research, will help strengthen Pakistan's research infrastructure.

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