

## Genus *Coccinella* (Coccinellidae: Coleoptera) from District Buner Khyber Pakhtunkhwa Pakistan

Kausar Saeed<sup>1\*</sup>, Muhammad Nasir Khan Khattak<sup>2</sup>, Falak Naz<sup>3</sup>, Naveed Akhtar<sup>2</sup> and Muhammad Fiaz Khan<sup>2</sup>

<sup>1</sup>Department of Zoology, Abdul Wali Khan University Mardan (Buner Campus), Khyber Pakhtunkhwa, Pakistan

<sup>2</sup>Department of Zoology, Hazara University Mansehra, Khyber Pakhtunkhwa, Pakistan

<sup>3</sup>National Insect Museum, NARC, Islamabad, Pakistan

### Abstract

Ladybird beetles belong to family Coccinellidae and are important group of beetles because they are important universal predatory and occupies important place in biological control. In present study, a survey was conducted to explore the ladybird beetles from Azad Jammu and Kashmir during 2009-2011. A total of 13 species of Ladybird beetle under eleven genera and three subfamilies (Subfamily Chilocorinae, Subfamily Coccinellini and Subfamily Epilachnini) were collected. These species were *Brumoidus suturalis*, *Coccinella septempunctata*, *Coccinella transversalis*, *Menochilus sexmaculatus*, *Propylea dissecta*, *Coelophora bissellata*, *Oenopia sauzeti*, *Aiolocaria hexaspilota*, *Psyllobora bisoconotata*, *Harmonia dimidiata*, *Henosepilachna vigintioctopunctata*, *Henosepilachna septima* and *Afidentula manderstjernae*. Detail description of adults, Post coxal line and genitalia structures (male and female) are provided for each species along with color plates.

**Keywords:** Coccinellidae; Distribution; Buner; *Chilocorus infernalis*

### Introduction

The ladybird beetles are known for their predacious nature. They play important role in regulating insect pests, especially aphids, leafhoppers, scale insects, mealy bugs, mites and soft bodied insects [1]. It has six sub-families among which sub-family Chilocorinae is most important as its members are predators of scale insects aphids, mealybugs and psyllids.

In Pakistan, some work has been done by different workers and reported some important species of Chilocorinae [2-5]. The Chilocorinae of Azad Jammu and Kashmir is poorly explored and some scanty information is available. Ahmad et al. [6,7] studied the temporal and spatial distribution of *Chilocorus infernalis* at different altitudes and on different varieties of apple in Azad Jammu and Kashmir (AJK).

Inayatullah [8] listed the Coccinellids (Chilocorinae) of Poonch district of Bagh and of district Sudhnuti [2,3]. Although a comprehensive list of coccinellids of AJK is provided by in which subfamily Chilocorinae was also included [9].

The fauna of District Buner is almost unexplored in this regard despite the diverse and unique habitat. Only three phytophagous species are reported so far by Naz [10]. Buner is the district of Malakand division (Khyber Pakhtunkhwa) which is mostly hilly area. It is surrounded by Swat in North, Malakand agency in west, Shangla in east and Swabi and Mardan in south. The study area is mostly mountainous and there are some plain tracts in between. Agriculture in this area is mainly focused on tobacco, wheat, maize and to some extent citrus, persimmon and Peach orchards. The biodiversity of the area is facing threat from urbanization, marble industry and tobacco cultivation. Before diminishing of the important taxa from the area it is aught most important to explore and document the fauna and flora of the area and make a comprehensive plan for its conservation.

The current study was conducted to explore the Coccinellidae of district Buner Khyber Pakhtunkhwa Pakistan.

### Materials and Methods

#### Collection of ladybird beetles

Collection of ladybird beetles was carried out from the selected localities during 2013 and 2014 in the active season of Ladybird beetles. Each locality was visited fortnightly.

### Identification

The specimens were identified with the help of available literature and already identified specimens, which are preserved in the insect Museum of Agricultural University Peshawar, National insect museum (NARC), Pakistan Museum of Natural History Islamabad and NIFA. All the identified specimens will be deposited in the Zoological Museum, Hazara University, Mansehra. The identification was done by following [11,12].

### Genitalia Examination

The genitalia examination was done by following the method of Majerus and Kearns [13].

### Drawing and Photography

In order to draw the diagram of the fine detail taxonomically important parts, Camera Lucida attached with stereoscope were used. However free hand drawing can be used. Some taxonomic parts and adult specimens were photographed with digital (CCTV) camera attached with microscope.

### Description

Descriptions of the specimens were made on the visual observation and obviously differentiable traits followed by Kapur [11].

### Results and discussion

During the current study twelve different localities in district Buner Khyber Pakhtunkhwa were surveyed in the period of 2013 and 2014

\*Corresponding author: Kausar Saeed, Department of Zoology, Abdul Wali Khan University Mardan (Buner Campus), Khyber Pakhtunkhwa, Pakistan, Tel: +92 937 9230640; E-mail: akhtarzoologist@gmail.com

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for the collection of Coccinellide ladybird beetles. This collection was taxonomically treated, which revealed that there are thirteen species of Ladybird beetle under eleven genera and three subfamilies (Subfamily Chilocorinae, Subfamily Coccinellinae and Subfamily Epichlicninae).

**Subfamily: Chilocorinae (Chapin, 1965a); Type Species: *Brumoides suturalis***

**Distinguished characters**

Body oval, convex and glabrous dorsally. Antennae 8 segmented with 3-segmented club, apical segment partly embedded in penultimate. Maxillary palpus with terminal segment securiform. Elytral margin relatively reflexed. Abdomen with 6 visible sternite in male while 5 in female. Postcoxal line complete. Legs with femur not inflated, claw slightly compact at base, no angular basal tooth.

**Remarks**

*Brumoides* genus is cosmopolitan. In Buner region this genus is represented by only one species *Brumoides suturalis*. *Brumoides suturalis*

***Brumoides suturalis* (Fabricius, 1798)**

**Material examined:** 4 ♂ 3 ♀ Pak, KPK, Buner, Gokand, 2. vi. 2010 (Tahir); 3 ♂ Pak, KPK, Buner, Daggarr, 20. vii. 2012 (Tahir) (Plate 1).

**Distinguished characters**

Body oval shape, head brown and not much deeply inserted. Eyes large and brownish black. Antennae small (8 segmented), the basal segment triangular in shape, wide and longer than the second segment. Maxillary palpus 4 segmented and terminal segment with oblique cut at apex. Pronotum yellowish brown, slightly projected on each anterior lateral side and very finely pitted. Elytra yellow with three brownish black longitudinal stripes, one on each elytron and one on the mid dorsal line of junction of elytra, not touching posterior margin. First and second abdominal sternite densely covered with yellow hairs. Ventrally body yellowish brown.

**Size**

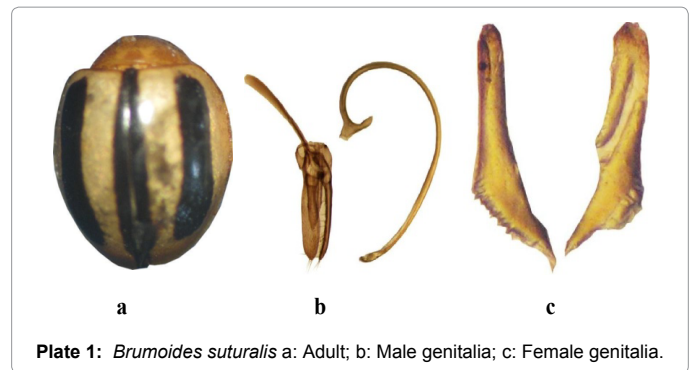
Male (N=6), 3.0 mm, Range: 2.6-4 mm, Female (N=4), 3.2 mm.

**Genitalia**

Male genitalia: Phalobase; trab simpl and long with apex sharp and rounded. Median lobe flattened at base, constricted at middle and distally pointed. Basal piece quadrate. Median lobe shorter than parameres. Parameres moderate in size, thick, distally flattened and rounded, apex densely hair at apex. Siphon; capsule thick, outer arm short and narrow, inner arm short and straight. Siphonal tube forming big loop gradually curved to middle then straight to apex, narrow without hairs.

**Remarks**

*Brumoides suturalis* is important predator and feeds on different hosts like mites, psyllids, coccids and aphids and protects the cereal crops from the damage of these pests. Khan et al. [2] reported it on *Aleurocanthus husaini* Corbt. *Aphis cracciuora* Koch., *Aphis fabae* Scopoli and *Aphis gossypii* Glover. Khan et al. [14] found *Brumoides suturalis* feeding upon three species of aphids, one species of mite and six species of coccids [2]; recorded it from NWFP [5]; recorded this species from Dir Lower of Malakand division.



**Seasonal occurrence**

Available collection data show that this species is active from May to November in Buner district. In the present studies it was found abundantly during October and November.

**Distribution**

India, Afghanistan, Iran, Iraq, Israel, Jordan, Lebanon, Oman, Saudi Arabia and Syria [4].

**Subfamily II: Coccinellinae Latreille, 1807**

**Description**

Body medium to large and dorsally glabrous. Antenna 11 segmented, with well developed club; antennal insertion between mandibular bases and eyes. Mandibles strong having basal tooth, apex bidenticulate. Terminal segment of maxillary palpi securiform or elongated, obliquely truncate. Mentum moderately joining submentum. Pronotum not closely joining elytral bases. Scutellum small and triangular, epipleura usually broad, reaching apex without foveae. Elytral punctated simply. Legs rather long, tibiae without spurs. Tarsi cryptotetramerous.

**Genus *Aiolocaria* Crotch, 1871; Type Species: *Aiolocaria hexaspilota* Hope**

**Diagnostic characters**

Body length measures 8.5 mm to 12.2 mm. Body large, rounded and weakly convex. Antennae longer than interocular distance. Pronotum narrower than elytra. Anterior margin of pronotum concave and trapezoidal, lateral margin almost rounded. Scutellum broad than long and triangular in shape. Postcoxal line incomplete. Claws large, thick, with tooth at base.

***Aiolocaria hexaspilota* (Hope, 1831)**

**Description**

Body somewhat round, slightly convex, broadly oval. Head and mouth parts black or partly dark brown. Antenna darkish, slightly shorter than head width. Pronotum black with white or apple yellow large spots at sides. Elytra orange red with red or orange spots at sides. Venter and legs black; epipleura and lateral parts of abdominal segments dark red. Pronotum deeply excavated at anterior margins, angles rounded, lateral margins strongly convex; punctuation fine, sparse, homogeneous, surface shiny. Elytra with equal length and width. Elytral punctuation very fine, heterogeneous. Epipleura of elytra very broad, one-seventh width of body without foveae (Plate 2).

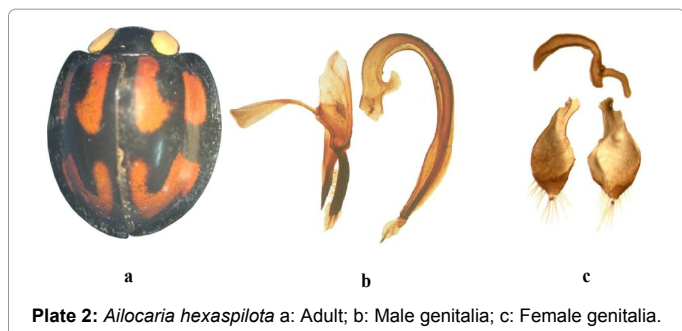


Plate 2: *Ailocaria hexaspilota* a: Adult; b: Male genitalia; c: Female genitalia.

### Male genitalia

Phalobase: Trab short, curved, narrow at base, distally broad gradually. Basal piece more oblong. Parameres cylindrical with rounded apex, provided with short hairs on dorsal side and long hairs on apex. Median lobe broad, gradually narrowing towards apex, apex sharply pointed. Siphon, capsule asymmetrical, outer arm vertical, highly thick, directed towards siphonal tube, inner arm short and hooks like structure. Siphonal tube very thick and curved, swollen beyond middle, apex terminated in needle like structure surrounded by membrane.

### Remarks

This species is variable in colour pattern. The Type locality of the species is Nepal. The species appears to be widespread in the Himalayas and has already been recorded from Kashmir [11]. In Russia this beetle play important role in controlling *Gastrolina depressa* which is important pest of coniferous broad leaved forests tree *Juglans manshurica* [15,16] also confirmed this species from Nepal Himalaya. Recently, Rafi et al. [4] reported this species from the himalyan region of Pakistan including Kashmir whereas [17] reported this species from China.

**Past record:** Khan et al.; Rahatullah et al. [2,5] recorded this species from various localities of Pakistan.

**Present record:** During present study it was recorded from Barkaly, Totalai, Nawagai, Nagrai and Malka.

**Seasonal occurrence:** This species was found active in the month of July.

**Distribution:** Russia, China, Japan, Korea, India, Taiwan, Burma, Nepal and Pakistan [4,18].

**Genus *Coccinella* Linnaeus, 1758; Type Species: *Coccinella septempunctata* L.**

### Diagnostic characters

Body broadly oval, moderately to strongly convex. Head black in colour with 2 pale spots or pale band. Pronotum black with white spots of variable size, spots sometimes connect to anterior margin by pale band. Antennal club compact, apical segment with truncate apex. Elytra red or yellowish brown with black dots or spots, elytral base broad than pronotum, epipleura expanded. Lateral elytral margins narrow, epipleuron nearly flat. Tarsal claw with large basal tooth. Postcoxal lines incomplete.

***Coccinella septempunctata* (Linnaeus, 1758)**

### Description

Body rounded to oval, convex, almost hemispherical, and densely punctate. Head black with yellow hairs and a pair of yellow spots. Eyes

small and minutly faceted. Pronotum twice as broad as long, finely punctate, black with small yellow spots at anterior margins. Scutellum black, small and nearly equilateral. Elytra glabrous, with 7 black spots, one triangular common post scutellar, one on each elytron at middle near suture, 2 near lateral margins. Middle and hind tibia with 2 spurs. Abdomen black, densely covered with short yellow pubescence (Plate 3).

### Male genitalia

Phalobase: Trab short and uniform in thicknrss. Basal piece oblong. Paramers thick, cylindrical, slightly curved, tip covered with densely hairs. Median lobe short, very broad at base tapering gradually beyond middle to apex, tip rounded. Siphonal capsule; asymmetrical somewhat Y shaped, thick, outer arm straight and thick, inner arm comparatively thin. Siphonal tube; thick, cylindrical, abruptly bent at base, then almost straight for most of its length, apex appears to be distorted at three points, apex flattend.

### Remarks

It is cosmopolitan and adopted to almost all habitats of agricultural crops, range lands and forests. This wide spread lady beetle seems to be very common in the whole AJK like other parts of the country. The elytral spots are considerably variable in size and may be much enlarged or sometimes connected with each other or confluent. This variation is classified into four morphs. This Palaearctic species extends widely beyond the Palaearctic region.

**Past record:** Previously Khan et al.; Khan et al.; Crotch [2,9,19] reported this species from Pakistan.

**Present record:** It was collected from all localities of district Buner.

**Seasonal occurrence:** Available data shows that this species is active throughout the year.

**Distribution:** Pakistan, Bhutan, India, Nepal, North America; Palaearctic region; Sri Lanka [2,18].

***Coccinella transversalis* (Fabricius, 1781)**

### Description

Body somewhat elongatee, ventrally black. Head almost inserted, not visible from above. Pronotum black with anterio-lateral orange spots. Elytra dull orange to yellowish brown, with black spots variably arranged. On each elytron the first irregular patch small; the second patch across elytra large; the third only rounded spots across the elytra, with broad longitudinal black band along the inner junction of elytra (Plate 4).

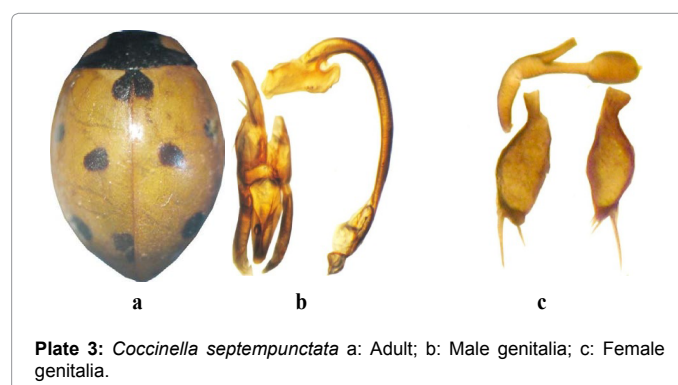


Plate 3: *Coccinella septempunctata* a: Adult; b: Male genitalia; c: Female genitalia.



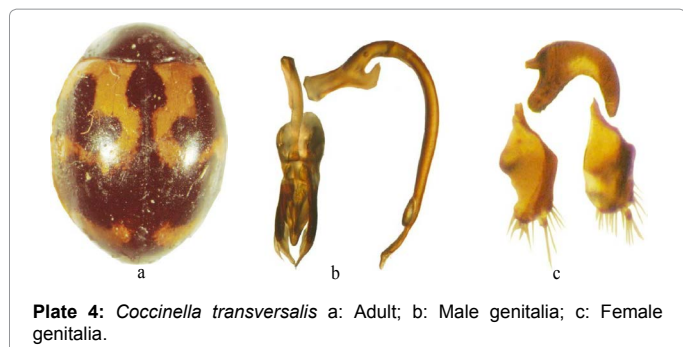


Plate 4: *Coccinella transversalis* a: Adult; b: Male genitalia; c: Female genitalia.

### Male genitalia

Phalobase: Trab long and thick. Basal piece quadrate. Parameres thick but short, with rounded tips, distal and apical portion with long hairs. Median lobe broad at base, narrow at apex. Siphonal capsule unique, outer arm long straight and thick, inner arm short and hooked. Siphonal tube bent at base circularly, forming a loop, then straight up to the three-fourth of its length. A transparent bubble like structure on dorsal side on subdistal portion, abruptly thin at apex, forming hook.

### Remarks

The species is originally described from South India, however the species extends to other parts of Palaearctic region, upto Japan in north and to Australia in south. It is also variable in colouration especially in the elytral pattern.

**Past record:** Khan et al. [2] record this species from Pattan Sher Khan (Sudhnuti), while Inayatullah et al. [8] reported from Rawalakot, Hajera (Poonch); Khan et al. [9] reported it from Rawalakot, Hajera Pattan Sher Khan.

**Present record:** During present research work specimens of this species were collected from Malka, Gokand, Shaheed e Sar, Kingergaly and Pirbaba.

**Seasonal occurrence:** This species was collected from April to October.

**Distribution:** Australia, Bangladesh, China, India, Indochina, Indonesia, Japan, Nepal, New Zealand, Sri Lanka and Pakistan [9,18].

### *Coccinella undecimpunctata* Linnaeus, 1758

#### Description

Body elongated, oval, dorsally convex and densely punctate. Head black. Antennae short, yellow brown with distinct club. Eyes large with fine facets. Pronotum black, yellow spots at each anterior angle, spots often elongated along lateral margin. Elytra yellow to red, with five black spots on either side. A large scutellar black spot present in addition to the common spot on both elytra. Abdomen black and densely punctate with short yellow pubescence.

#### Male genitalia

Trab of phalobase long and thick. Parameres cylindrical, curved at middle provided with apical thorns. Median lobe thick and broad. Siphon; head capsule normal, siphonal tube broadly bent, forming big loop, subapical portion narrow up to apex.

#### Remarks

Superficially similar to *C. septempunctata* but smaller in size. Therefore sometime it is confused with *C. septempunctata*. The

two can be separated by spotted pattern. In the case of *Coccinella undecimpunctata*, elytra red with 11 black spots of nearly equal size. This species can easily distinguish from *C. aini* by male genitalia [15].

**Past record:** Khan et al.; Inayatullah et al.; Rafi et al. [2,8,12] reported this species from Pakistan.

**Present record:** During this study it is collected from Daggar, Budal, Chinglai and Barkaly.

**Seasonal occurrence:** Specimens of this species were collected from May to June.

**Distribution:** Pakistan, Central Asia, China, Europe, Kazakhstan, Mongolia, North Africa, North America, Russia, Siberia [2,12].

### Genus *Harmonia* (Mulsant, 1846); Type Species: *Harmonia dimidiata* (Fabricius, 1781)

#### Diagnostic characters

Body oval, seldom oblong and moderately convex. Antennae one and half times longer than head width, antennae compact and clubbed, 9<sup>th</sup> segment almost longer than the remaining segments, 10<sup>th</sup> segment transverse and strongly expanded toward apex. Anterior margins of the clypeus straight. Pronotum deeply excavated interiorly and not covering the eyes. Scutellum triangular and broad. Claws with small tooth at base.

### *Harmonia dimidiata* (Fabricius, 1781)

#### Description

Body large, strongly oval and convex. Head dark brown, longer than broad, deeply inserted, invisible from above. Pronotum variable, sometime straw yellow with 5 black spots or with lateral spots usually joined to form 2 curved lines, M-shaped mark present. Pronotum in some specimen's brownish black with 2 black rounded spots in centre. Scutellum black posteriorly. Elytral colour pale yellow with or without black spots or one third of anterior portion brownish yellow, the remaining elytra black (Plate 5).

#### Male genitalia

Trab of phalobase long, thin and provided with membrane distally. Basal piece large and oblong. Parameres medium in size, thick, slightly curved, provided with hairs on subapical portion and apex. Median lobe basally thick, then gradually tapering towards apex, constricted at sub-apex, tips rounded and curved.

#### Remarks

This Oriental species is very variable in color pattern. More than three polymorphic forms exist in AJK alone. The species is widely

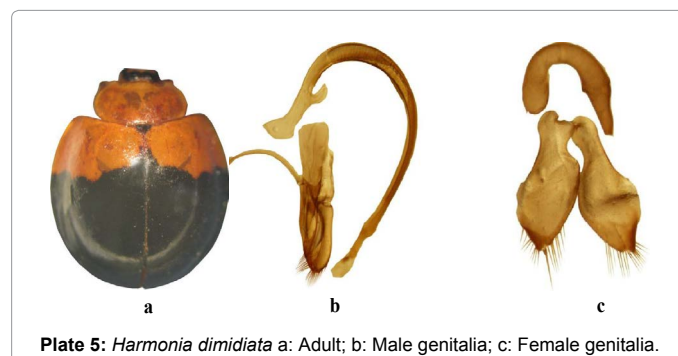


Plate 5: *Harmonia dimidiata* a: Adult; b: Male genitalia; c: Female genitalia.

distributed in the Himalayas, being known from Kashmir to Assam. This species is extremely variable in colour pattern, there being some 15 aberrations already recorded [12,14]; recorded it from Pakistan. They also mentioned that in Rawalakot this species exist in two polymorphic forms [17]; also reported three polymorphic forms of this species from China.

**Past record:** Khan et al.; Inayatullah et al.; Rafi et al. [2,8,12] recorded this species from Pakistan.

**Present record:** During this study it is collected from Budal, Malka, Chinglai, Gokand and Daggar.

**Seasonal occurrence:** During present investigation this species was collected from April to October.

**Distribution:** Assam, Bhutan, China, Kashmir (India), Nepal, Taiwan. This species is widely distributed in northern India, especially in the Himalayas, and in China and Japan although its type locality remains "Coromandel" and Pakistan [14,12].

**Genus *Coelophora* Mulsant, 1850; Type Species: *Lemnia fraudulenta* Mulsant; *Coelophora bissellata* (Mulsant, 1850)**

#### Description

Body black on ventral side, rounded and weakly convex. Head deeply inserted. Pronotum brownish with black colour at middle. Scutellum black. Pronotal or elytral spots sometimes reduced in size or number. Elytra dull orange with 4 black round spots on each elytron and one on the mid dorsal line along junction of elytra near the scutellum (Plate 6).

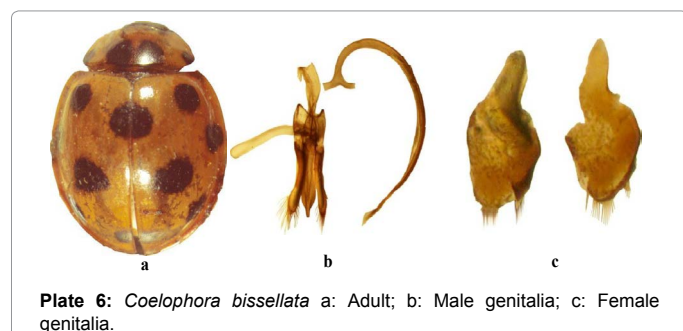
#### Male genitalia

Trab of phalobase short, thick but constricted at middle. Basal piece broad, dorsally deeply concave. Parameres thick, bent at middle, apex rounded and provided with long hairs. Median lobe thick, broad except apex. Distal portion abruptly thin and curved. Siphonal capsule Y shape. Tube broadly curved, semicircular, broaden beyond middle then narrow up to apex. Apex slightly widened and transparent.

#### Remarks

The species somewhat resembles with *L. duvauceli* (Mulsant) in ground colour and elytral spot pattern. However they can be separated by the spot pattern of pronotum. *C. bisselata* has two additional small lateral black spot while *L. duvaceli* lack these spots. Similarly *C. bisselata* has two additional spots on anal portion of elytra. For exact differentiation between the two species, male genitalia may be studied.

**Past record:** Previously it was reported from Pakistan [8,12].



**Plate 6:** *Coelophora bissellata* a: Adult; b: Male genitalia; c: Female genitalia.

**Present record:** During this study it is recorded from Barkaly, Shaheed e Sar, Nawagai, Nagrai and Daggar.

**Seasonal occurrence:** This species was found active from April to October.

**Distribution:** Bangladesh, China, India, Nepal, New Guinae, Sumatra, Thailand, Vitenam and Rawalakot [8,18].

#### Genus *Cheilomenes* Dejean, 1836

**Type species:** *Coccinella lunata* Fabricius, by subsequent designation of Crotch [19].

#### Diagnosis characters

Body nearly rounded and convex. Head yellowish-brown deeply inserted. Pronotum yellowish brown with a transverse brownish black band along the middle line of the posterior margin. Elytra in some specimens brown and the longitudinal brownish black on the mid dorsal line of junction of elytra. Elytra finely pitted and without hairs.

#### Remarks

This genus is distributed worldwide, but they are in large number found in Indo-Malayan subregion; the species of this genus has been reported to feed upon aphids. During this study one species of this genus *Menochilus sexmaculata* were collected from all the localities of Malakand division. Highest number collected was 35 in August and lowest number 7 in October. Individuals of this species were available in large number from July to end of October district Buner.

#### *Cheliomenes sexmaculatus* (Fabricius, 1781)

#### Description

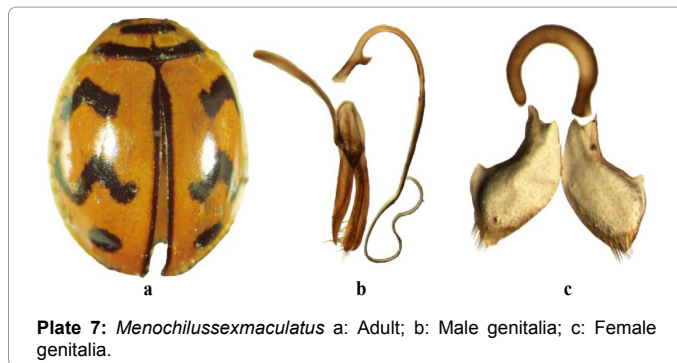
Body nearly rounded and glabrous. Head yellowish brown, invisible from above, completely covered by pronotum. Pronotum yellowish brown with two transverse black brownish band, one at posterior margin and another anterior to first one and connected to each other in center. Scutellum brownish black. Elytra highly variable in colour but generally brownish yellow, spots black and decorated with transverse zigzag patches. On each elytron the first patch may be small, inverted V-shaped, the second complete W-shaped and the third rounded. A narrow longitudinal brownish black band present along the line of elytra junction (Plate 7).

#### Male genitalia

Trab long and broad distally. Basal piece oblong parameres long, thick, subapical portion broad, covered with long hairs on subapical portion. Median lobe shorter than parameres, thick most of its length, outer side straight, inner side convex slightly constricted distally, tip pointed. Siphonal tube highly curved at base then straight upto three-fourth of its length.

#### Remarks

Geographically this is oriental species and mostly found in plain areas, however sometime can be found in foot hills. The size and colour pattern of the species are variable. This is the commonest, highly misidentified coccinellid due to the occurrence of numerous colour variants. The various colour morphs of this species are frequently misidentified as *Micraspis discolor* and *Chilocorus nigrata*. The following variations are frequently seen: (a) Elytra yellowish/pink/orange without any markings except for a black sutural stipe, (b) Elytra and pronotum partially black leaving only the margins, (c) More or less completely



black, and (d) The elytral markings coalesce and form broader bands. The pronotal marking is always constant and can be faintly seen even in completely black forms. All these intermediate forms are found in the field. This species has been reported to feed upon aphids [1,18] has used the name *Menochilus sexmaculatus* for this species [20] named as *Cheilomene sexmaculata*.

**Past record:** It is widely distributed throughout the country and reported almost by all previous workers.

**Present record:** It has been collected almost from all localities of district Buner.

**Seasonal occurrence:** Active almost throughout the year in several parts of Buner district. Individuals of this species were found in large numbers from May to August.

**Distribution:** Afghanistan, Bangladesh, Bhutan, China, India, Indonesia, Iran, Japan, Malaysia, Myanmar, Nepal, New Guinea, Oriental region; Philippines, Sri Lanka, Taiwan, Vietnam and Pakistan [2,12,18].

**Genus *Oenopia*, Mulsant, 1850; Type species: *Oenopia Kirbyi***

#### Diagnostic characters

Body small sized, oval and weakly convex. Antennae compact and club shaped, 9<sup>th</sup> and 10<sup>th</sup> segments strongly transverse. Interior margins of frons between eyes parallel. Pronotum not rounded. Scutellum triangular. Pronotum narrowed than elytral base.

**Type Species: *Oenopia cinctella* Mulsant; *Oenopia sauzeti* Mulsant, 1866**

#### Description

Body nearly round and strongly convex. Head black. Pronotum black with yellowish spots, loosely attached with elytra. Head medium in size; eyes small. Elytra light yellowish-white with brownish black spots. Spots quite large and rounded. Six spots on elytra; 2 complete on each elytron and 2 on mid-dorsal line of junction of the elytra. The 2 central spots connected by yellow bands to one another (Plate 8).

#### Male genitalia

Trab long and slightly curved inward. Parameres long and broad at base broad, curved inward at middle. Median lobe; thick, short, subapical portion broad, curved and provided with long hairs. Median lobe thick, short, abruptly narrow at subapex. Apex curved inward. Siphonal capsule asymmetrical, triangular, outer arm long while inner arm short, tube deeply curved at base, terminated in transparent membrane.

#### Remarks

Its distinguishing character from *O. mimica* was already given. Rafi et al. [12] recorded it from Northern Pakistan and Azad Jammu Kashmir. According to the Zoological survey of India this species was reported from Murree and Dalhousie Hills (Punjab), Kumaun Hills (U. P) Sikkim and Darjeeling District (N. Bengal). In this species colour pattern does not appear to be very variable [11]. Miyatake [21] named this species *Gyrocaria sauzeti*.

**Past record:** Previously Khan et al.; Inayatullah et al.; Rafi et al. [2,8,12] reported it from Pakistan.

**Present record:** During this work it was found at Daggar, Nawagai, Malka, Kingargalai and Gokand.

**Seasonal occurrence:** Available data show that this species is found active from April to October however it was found abundantly during May, June and August.

**Distribution:** Bhutan, Himalayas, India, Myanmar, Nepal, Sikkim, Southern China, Thailand [8,18].

**Genus *Propylaea* Mulsant, 1846; Type Species: *Propylaea luteopustulata*, Mulsant**

#### Diagnostic characters

Body oval and slightly depressed. Clypeus protrude posterior-laterally. Antennae comparatively short and 10 segmented. Eyes small and finally faceted. Pronotum and elytron with lateral margin weakly wider. Epipleura horizontal, interior margin extended to apex. First abdominal sternite incomplete. Spurse of the tibia is very short. Male genitalia symmetrical while female genitalia with infundibulum.

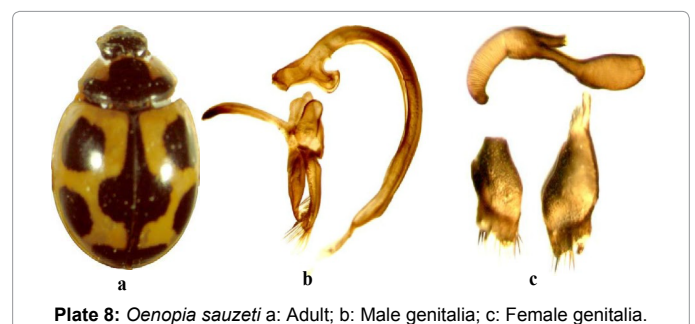
***Propylaea dissecta* (Mulsant, 1850)**

#### Description

Body comparatively small, moderately convex and black ventrally. Head brown and scutellum black in colour. Pronotum black and half pale yellow. Elytra brownish with 4 black spots, 2 on each elytron, one anteriorly and one posteriorly. Mid dorsal line of elytra black. Black parasutural stripe on each elytron. Epipleura pale yellow (Plate 9).

#### Male genitalia

Trab moderately long, slender and curved. Basal piece and Parameres normal. Median lobe; uniformly thick, tubular, length equal to parameres, tip pointed. Siphonal capsule normal, arm not equal in size, tube abruptly bent at base, then straight up to apex, tip constricted and convoluted in the form of hair like structure.





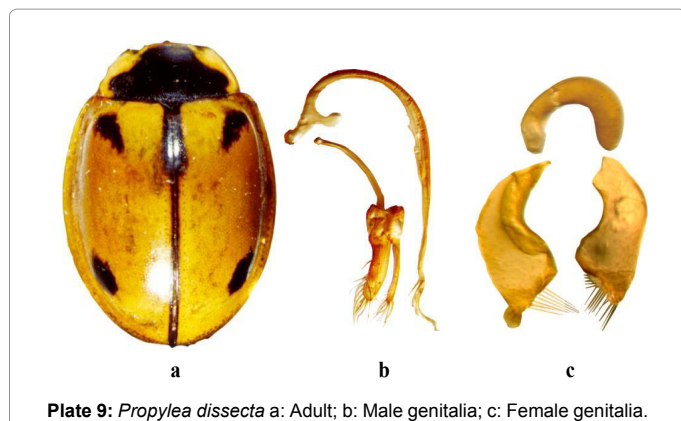


Plate 9: *Propylea dissecta* a: Adult; b: Male genitalia; c: Female genitalia.

### Remarks

Mulsant described this species three times from India, but Crotch [19] declared as these forms merely of one species. Weise [22] treated the forms *dissecta* and *feliciae* as aberrations of *Halyzia* (*Propylea*) *Japonica* and his opinion has been adopted by many authors [23]. However, Miyatake [21] stated that *P. japonica* and *P. dissecta* have some difference despite the strong similarity in male and female genitalia and included these two to the *feliciae* type of *P. dissecta*. Rafi et al. [12] reported this species from Rawalpindi, Lahore, Changa Manga, Kala ShahKaku in Pakistan. This species is an important predator of aphids, psyllids and whiteflies.

**Past record:** Previously Khan et al.; Inayatullah et al.; Rafi et al. [2,8,12] reported this species from Pakistan.

**Present record:** During present course of work this species was recorded from all localities of district Buner.

**Seasonal occurrence:** This species was found throughout the year from April to October.

**Distribution:** Bangladesh, India, Nepal and Pakistan [2,8,18].

**Genus *Psyllobora* Chevrolate, 1836; Type Species: *Coccinella lineola*, Fabricius, 1792**

### Distinguished characters

Body broad oval, moderately convex. Head slightly transverse. Clypeus excavated. Pronotum feebly excavated at anterior margin, covering only posterior half of eyes. Elytra yellow with black spots. Prosternum without carinae. Mesosternum short. Postcoxal lines a quarter circle in shape, nearly reaching apex of sternite. Genus spread worldwide and includes 44 species. Korschefsky [23] 2 species in Palearctic and one species in Russia Mycetophagous.

***Psyllobora (Thea) bisoconotata* (Mulsant, 1850)**

### Description

Body small and elongated, brownish yellow on lower side, finely pitted and covered with very fine hairs. Head brownish yellow, slightly wider than its length and not easily visible from dorsal side. Pronotum much broader than long and without spots. Pronotum and elytra uniform in colour. Tarsi 4 segmented (Plate 10).

### Male genitalia

Trab of phalobase long and distally expanded. Basal piece oblong. Parameres almost equally thick with long hair on subapical portion.

Median lobe broad, tapering from subapical portion, apex curved inward and pointed. Siphonal capsule absent, tube semicircular having same thickness, constricted at subapical portion. Apex curved inward.

### Remarks

Rafi et al.; Sharma and Joshi [12,20] reported *Psylloborabisoconotata* from Pakistan and India respectively. Pervez [24] reported its predator of aphids and mealy bug from India.

**Past record:** Khan et al.; Inayatullah et al. [2,12] reported this species from Pakistan.

**Present record:** During present work it was collected from almost all localities except Malka, Nagrai, Gokand, Pirbaba, Daggar and Kingargalai.

**Seasonal occurrence:** This species was active from April to October. However it was found abundantly during April, May and June.

**Distribution:** Africa, Arabia, India, Northern Saudi, Yemen, Pakistan [2,12,18].

### Subfamily III Epilachninae

### Diagnostic characters

Body pubescent, punctate but mostly uneven. Antennae inserted between anterior margins of compound eyes. Mandibles lack basal tooth, tip of mandible multidentate. Terminal segment of maxillary palpi axe-shaped. Tarsal claw bifid, with or without basal tooth. Post coxal line complete or sub complete.

**Genus *Henosepilachna* (Li, 1961); Type Species: *Henosepilachna sparsa*, Harbst**

### Diagnostic characters

Body shape mostly oval, often hemispherical with dorsum convex. Body covered with yellowish-grey pubescence on both sides. Length 6 mm to 7 mm. Head with light or dark black spot at middle. Antennae short with loosely articulated compact club. Pronotum punctuated, convex, narrow than elytral base. Post coxal line complete or sub complete, sometime angulate. Sixth visible sternite split longitudinally in female.

**Type Species: *Coccinella sparsa* (Herbst, 1786); *Henosepilachna vigintioctopunctata* (Fabricius, 1755)**

### Description

Body shape rounded, dorsally convex, ground colour yellowish red. Pronotum reddish brown with maximum spots 7, sometime

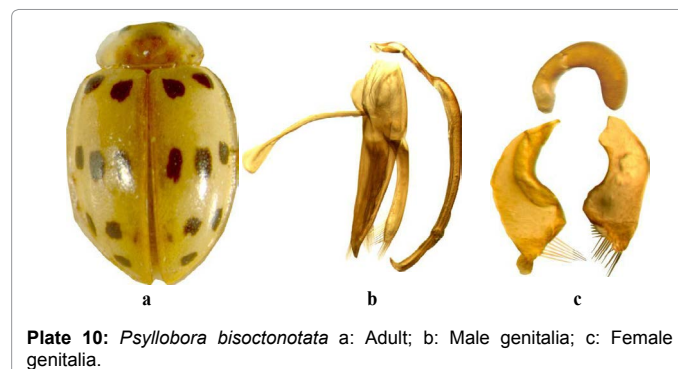


Plate 10: *Psyllobora bisoconotata* a: Adult; b: Male genitalia; c: Female genitalia.

spotless. Elytra colour pale brown or reddish brown. Elytral spots vary, minimum 12 spots and maximum 28 but mostly with 26 spots. Elytral spots usually lies in a straight line. Elytral apex angled (Plate 11).

### Male genitalia

Trab short curved and distally expanded. Basal piece short and rounded. Median lobe with basal knife edge distally curves up into an apical hook. Second half with two rows of hairs. Parameres with an apical thorn and covered with hairs shorter than those of median lobe. Siphon gently curved near the base, then straight, ending in a point.

### Remarks

Bielawski [25] has enumerated *H. vigintioctopunctata* and *H. sparsa orientalis* as different species in the same paper. It is variable both in the pronotal and elytral spots but can easily be distinguished by its sharp and distinct sutural angle at the apex of the elytra and by its characteristic male and female genitalia. Naz [10] reported as widely distributed species of Pakistan and with wide range of host plants. They also discussed the elytral spot variation.

**Past record:** Common wealth institute of biological control [26] reported it from Pakistan. Recently, Naz [10] reported it from the study area along with other large number of localities.

**Present record:** During present course of work this species is collected from Daggar, Nawagai, Chinglai, Barkay and Budal.

**Seasonal occurrence:** This species was found from April to October. The peak population can be found in monsoon season (July and August).

**Distribution:** China, India, Japan Myanmar, Nepal, Oriental region, Taiwan, Thailand [21].

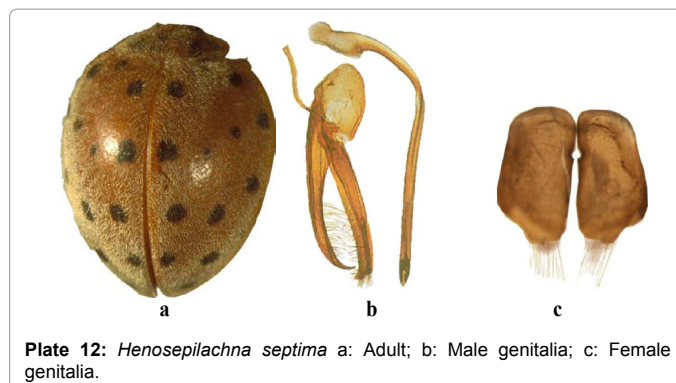
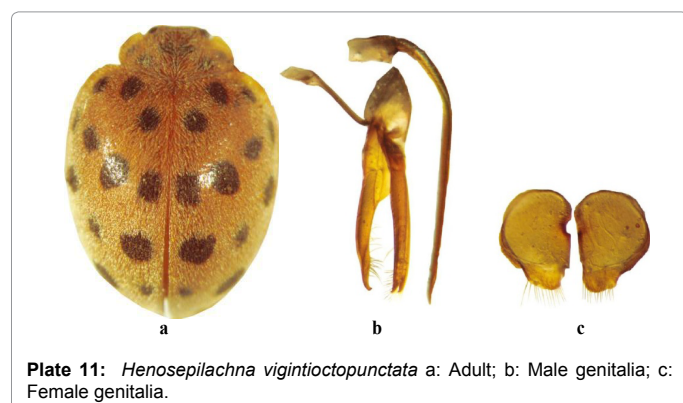
## *Henosepilachna septima* Dieke

### Description

Body large and highly convex dorsally. Head without spots. Pronotum with 2-6 spots, sometimes 4 and 7 spotted, spot 7 being hazy. Elytral spot pattern variable however not so complicated like that of *H. vigintioctopunctata*. All 14 elytral spots present and more or less rounded, the persistent spots on the whole bigger than the non-persistent ones. Spots not touching the suture or the margin (Plate 12).

### Male genitalia

Trab and basal piece normal. Median lobe with distinct basal knife edge, then straight for most of its length but bent up gently near apex,



terminated in a hook. Paramere long, thick, without distinct apical thorn, with short hairs on apex. Siphon: normal but siphonal tip compressed on one side, tapering like nib.

**Past record:** Previously reported only by Naz [10] from Pakistan and also from the study area.

**Present record:** During present study this species is collected from Daggar, Barkaly, Pirbaba, Budal and Shaheede Sar.

**Seasonal occurrence:** Available collection data suggest that this species is active during August and September.

**Distribution:** India, Indonesia, Malaysia, Sri Lanka, Vietnam [27].

## Genus *Afidentula* Kapur, 1958; 1958 *Afidentula* Kapur, Coleopterum Catalogue, p: 324

### Diagnostic characters

Body oval, mostly small, antennae almost equal to the width of the head, with compact club. Mandibles compact, sub-triangular in shape, highly tapering towards the apex, provided with three un-serrated teeth, median tooth absent. Only one apical tooth is visible, the other two not visible behind it. Tarsal claw bifid, the inner division shorten than outer, provided with sub-triangular basal tooth.

**Type Species:** *Epilachna manderstjernae* Mulsant, 1853.

## *Afidentula manderstjernae* (Mulsant), 1853

### Description

Body shortly oval, usually small; antennae almost equal to the width of the head, with compact club, Clypeus and labrum narrow; Mandibles compact, sub-triangular in shape. Pronotum with a transverse median spot. Elytra with 6 spots, 5 close to suture and sixth one seem to be break in the middle. Tarsal claw bifid, the inner division shorter than outer, provided with sub-triangular basal tooth (Plate 13).

### Male genitalia

Trab of phalobase simple, slightly curved and distally broad. Basal piece short and rounded. Median lobe gradually broadens from base to apex. Maximum width just before apex. The apex narrows abruptly to point, point slightly upturns. Parameres very thin, thread like and sparsely covered with hairs at apex. Siphon: Siphonal capsule unique, tube bent at 180° near base, curved slightly, turn outward sharply at right angle near apex and then gradually diminishing in thickness and tapering off into a very fine point.



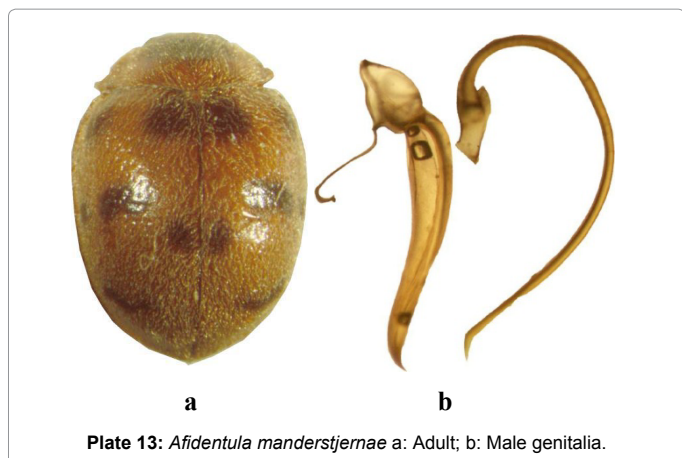


Plate 13: *Afidentula manderstjernae* a: Adult; b: Male genitalia.

## Remarks

This is a small size *Epilachna* beetle, reported from hilly areas of Nothren Pakistan. The type locality of the species is Asia and was also reported from India and Nepal [28]; Kapur [11] erected new genus for this species *Afidentula* and designated this species as its type species.

**Past record:** Previously this species was collected from Dhirkot and Rawalakot [10].

**Present record:** During present course of work it is collected from only two places viz Gokand and Daggar.

**Seasonal occurrence:** During present study it was collected from July to September.

**Distribution:** This species is known from India, Nepal, Vitenam, China, Pakistan [10,27].

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