RESEARCH PAPER

Annotated catalogue of the flower bugs from India (Heteroptera: Anthocoridae, Lasiochilidae)

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Abstract. The present paper provides a checklist of the flower bug families Anthocoridae and Lasiochilidae (Hemiptera: Heteroptera) of India based on literature and newly collected specimens including eleven new records. The Indian fauna of flower bugs is represented by 73 species belonging to 26 genera under eight tribes of two families. Generic transfers of Blaptostethus pluto (Distant, 1910) comb. nov. (from Triphleps pluto Distant, 1910) and Dilasia indica (Muraleedharan, 1978) comb. nov. (from Lasiochilus indica Muraleedharan, 1978) are provided. A lectotype is designated for Blaptostethus pluto. Previous, as well as new, distributational data and bibliographical references for each taxon are included. The following 11 species are recorded from India for the first time: Amphiareus rufficollaris Yamada & Hirowatari, 2003 (Tamil Nadu); Anthocoris dimorphus Zheng, 1984 (Himachal Pradesh); Bilia burma Yasunaga & Yamada, 2016 (Himachal Pradesh, Karnataka); Cardiastethus kathmandu Yamada, 2016 (Uttarakhand); Lippomamus brevicornis Yamada & Hirowatari, 2004 (Karnataka, Mizoram, Tripura); Montandoniola bellatula Yamada, 2007 (Karnataka); Physopleurella armata Poppius, 1909 (Karnataka); P. flava Carayon, 1958 (Karnataka); P. pessoni Carayon, 1956 (Tamil Nadu); Rajburicoris styli Carpintero & Dellapé, 2008 (Tamil Nadu); and Xylocoris (Proxylocoris) cerealis Yamada & Yasunaga, 2006 (Karnataka). The paper provides synthesis of the regional taxonomical work carried out until now, along with biological notes (habitats, prey types, etc.). The paper will serve as baseline data for future studies on Anthocoridae and Lasiochilidae.

Key words. Hemiptera, Heteroptera, Anthocoridae, Lasiochilidae, flower bugs, biocontrol, catalog, new combination, taxonomy, India, Oriental Region, Palaearctic Region

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Introduction

Insects in the family Anthocoridae sensu lato (Hemiptera: Heteroptera) are referred to as minute pirate bugs or flower bugs. The Anthocoridae sensu lato include three families, Anthocoridae sensu stricto, Lasiochilidae, and Lycocoridae (cf. Schuh & Stys 1991) about 100 genera with 500–600 species presently described in the world, distributed approximately from 70°N to 56°S (Péricart 1996, Lattin 1999, Henry 2009). These insects are better known in the Northern Hemisphere than in the Southern Hemisphere with rich diversity in the tropics and the Holarctic Region. Fewer Palaearctic and Oriental species are discovered in comparison to the number of Nearctic species (Carpintero 2002, Horton 2008). Reuter (1884) provided a landmark monograph of the world Anthocoridae. An excellent overview of Anthocoridae and its related families was also provided by Schuh & Slater (1995) in their review of true bug fauna of the world. Several regional monographs and catalogs are available: Péricart (1972) (West-Palaearctic Region), Önder (1982) (Turkey), Henry...
Anthocorid bugs are generalist predators, globally used as efficient biocontrol agents (Deligeorgidis 2002, Kim et al. 2008), and hold considerable promise for ecological agriculture in India as well (Ananthakrishnan & Suresh-kumar 1985, Nasser & Abdurahman 2004, Ballal & Gupta 2011, Ballal & Yamada 2016). However, until now there has been no comprehensive review of minute pirate bugs known from India. The group is inadequately documented, the species are poorly represented in collections, and much confusion exists in naming the species. Some of the major regional contributions include those of Distant (1904a,b, 1906, 1910), Poppius (1909, 1913), Ghauri (1965, 1972a), Rajasekhar (1973), Muraleedharan & Ananthakrishnan 1978a); West Bengal: Andhra Pradesh: Tirupati (Ballal & Yamada 2016). The faunal records of anthocorids from India are patchy and very limited but rather interesting, with many of them predaceous on crop pests or pests in storage facilities. Most of the known species are endemic (Pericart 1987, 1996) but with affinities to South-Palaearctic elements from where the species later dispersed towards the Oriental Region and across the Bering Straits into the Nearctic Region (Pericart 1996, Li et al. 2012). Indian anthocorids are important to establish a zoogeographical scheme between East and Southeast Asian species. The lack of any comprehensive taxonomic studies (except the key to genera by Muraleedharan & Ananthakrishnan 1978b), too few reliable faunal records, and the insufficient knowledge of biomics of Indian anthocorids do not allow proper evaluation of the biocontrol potential of anthocorids. We expect that the major portion of Indian anthocorids is still to be discovered. The catalogue provided here should represent a basic step for improvement of knowledge on Indian anthocorids.

Materials and methods

The present study brings together the scattered knowledge on the Anthocoridae and Lasiochilidae known from India. The study is based on available literature data, specimens examined, as well as unpublished information from the authors. In the synonymic lists for known taxa, only selected references, especially covering the Indian subcontinent, are cited.

Abbreviations of specimen depositories:

BmNH  | Natural History Museum, London, United Kingdom;
DeIC  | Senckenberg Deutsches Entomologisches Institut, Munchen-berg, Germany;
DOAT  | Insect Collection, Entomology & Zoology Group, Plant Protection Research and Development Office, Department of Agriculture, Bangkok, Thailand;
HnhM  | Hungarian Natural History Museum, Budapest, Hungary;
MCSN  | Museo Civico di Storia Naturale ‘Giacomo Doria’, Genova, Italy;
MNH  | Musee National d’Histoire Naturelle, Paris, France;
MzHF  | Zoological Museum, University of Helsinki, Helsinki, Finland;
NBAir  | National Bureau of Agricultural Insect Resources, Bangalore, India;
NhMw  | Naturhistorisches Museum, Wien, Austria;
NhRs  | Naturhistoriska Riksmuseet, Stockholm, Sweden;
Niaes  | National Institute of Agro-Environmental Sciences, Tsukuba, Japan;
Nkum  | Nankai University, Department of Biology, Tianjin, P.R. China;
Nmp  | National Museum, Prague, Czech Republic;
Npci  | National Pusa Collection, Indian Agricultural Research Institute, New Delhi, India;
OPU  | Osaka Prefecture University, Osaka, Japan;
PmNH  | Peabody Museum, New Haven, Connecticut, U.S.A.;
Sut  | Suranaree University of Technology, Nakhon Ratchasima, Thailand;
TKPm  | Tokushima Prefectural Museum, Tokushima, Japan;
Zmuc  | Zoological Museum, University of Copenhagen, Copenhagen, Denmark;
ZmuH  | Zoologisches Museum, Universitat Hamburg, Hamburg, Germany;
Zmum  | Zoological Museum, University of Moscow, Moscow, Russia;
Zsi  | Zoological Survey of India, Kolkata, India.

Results

Family Anthocoridae Fieber, 1836

Tribe Almeidini Carayon, 1972

Genus Almeida Distant, 1910

Almeida pilosa (Poppius, 1909)


Almeida pilosa: Distant (1910): 301 (new combination).

Type material examined. Synotypes: a♀, Celebes / Makassar / 174 / O. Beccari [printed + handwritten], ’194′ [printed, blue square], ’Museo Civ. / Genova’ [printed, orange square], ’Cardiastethus / pilosus n. sp. / B. Poppius det.’ [handwritten + printed], ’SYNTYPUS / Cardiastethus / pilosus / Poppius, 1909′ [printed + handwritten] (MSCN).

Distribution in India. Andhra Pradesh: Tirupati (Muraleedharan & Ananthakrishnan 1978a); West Bengal: Kolkata (Distant 1910).

General distribution. Outside India it is known from Indonesia (Sulawesi Archipelago) (Distant 1910), Sri Lanka (Distant 1910), Taiwan (Poppius 1915), China (Hainan, Yunnan) (Bu & Zheng 2001), Japan (Yamada et al. 2016a).

Remarks. There is an alary polymorphism in the species (Muraleedharan & Ananthakrishnan 1978a).

Genus Lippanomanus Distant, 1904

Lippanomanus brevicornis Yamada & Hirowatari, 2004


**Distribution in India.** Karnata: Bangalore; Mizoram; Tripura. New record from India.

**General distribution.** Japan (Yamada & Hirowatari 2004).

**Lippomanus hirsutus Distant, 1904**

*Lippomanus hirsutus* Distant, 1904a: 221. *Syntypes*: sex not indicated, Myanmar, Karense and Tenasserim, Thagha (BMNH).

**Type material examined.** *Syntype*: ♀, ‘Type / H. T.’ [printed circle], ‘Lippomanus / hirsutus / Dis’ [Distant’s handwritten], ‘Carin Ghecu / 1300–1400 m / L. Fea II–III 88’ [handwritten], ‘Distant Coll. / 1911–383’ [printed], ‘Reprepared by / J. Péricart 1985’ [Péricart’s handwritten], ‘Lippomanus / hirsutus Dist. / ♀ holotype / J. Péricart vid. 1985’ [handwritten, red square] (BMNH). The type specimen examined here is attached to a holotype label, which has been put by J Péricart. However, the lectotype designation of this species has not been published so far.

**Distribution in India.** Tamil Nadu: Kodaikanal (Muraleedharan & Ananthakrishnan 1978a).

**General distribution.** Nepal (Péricart 1986), Myanmar (Distant 1904a), China (Hainan) (Bu & Zheng 2001).

**Material examined.** INDIA: HIMACHAL PRADESH: Shimla, 10.–15.ix.2015, C.R. Ballal (NBAIR).

**Distribution in India.** Shimla (Poppus 1909, Distant 1910).

**General distribution.** Endemic.

**Anthocoris confusus Reuter, 1884**


**Material examined.** INDIA: HIMACHAL PRADESH: unknown date and collector, 4 ♂♂♀7 ♀♀♀ (TKPM).

**Distribution in India.** Shimla (Poppus 1909, Distant 1910).

**General distribution.** Endemic.

**Anthocoris dimorphus Zheng, 1984**


**Material examined.** INDIA: HIMACHAL PRADESH: Shimla, 1 ♂ 1 ♀, 10.–15.ix.2015, C.R. Ballal (NBAIR).

**Distribution in India.** Shimla (Poppus 1909, Distant 1910).

**General distribution.** China (Sichuan) (Bu & Zheng 2001).

**Anthocoris flavipes Reuter, 1884**


**General distribution.** Armenia (doubtful record) (Péricart 1996), Kazakhstan (Péricart 1996), Kirgizia (Péricart 1996), Tajikistan (Péricart 1996), China (Xizang) (Bu & Zheng 2001), Iran (Ghahari et al. 2009).

**Biology.** The species was found on a number of important agricultural, horticultural and forest plants and feeds on species of several aphid genera including *Anuraphis* Del Guercio, 1907, *Amphicercidus* Oestlund, 1923, *Aphis* (Bu & Zheng 2001), *Brachycactus* Goot, 1913, *Macrosiphones* Del Guercio, 1911, and *Pemphigus* Hartig, 1839 (Bhagat 2015).

**Anthocoris indicus Poppius, 1909**


**Distribution in India.** West Bengal: Darjeeling (Poppus 1909, Distant 1910).

**General distribution.** Endemic.

**Anthocoris minki Dohrn, 1860**


**Comment.** There are two subspecies, *A. minki minki* Dohrn, 1860 (Europe) and *A. minki pistaciae* Wagner, 1957 (from Mediterranean to Central Asia and China), but it is not clear which of these is present in India. Önder (1982) believes that there is no significant difference between the two subspecies and they should be treated as synonyms.

**Anthocoris muraledhbarani Yamada, 2010**

(Fig. 2)


**Type material examined.** *Holotype*: ♀, progeny of the specimens originally collected at ‘INDIA: Karnataka / Bangalore, ix. 2008 / N13°01′05″ / E78°05′33″ / 932 m above MSL / C. R. Ballal leg.’ [printed], ‘Host Insect: / Ferrisia virgata / Host Plant: / Bauhinia purpurea / [Lab. Reared culture]’ [printed], ‘Holotype ♀ / Anthocoris muraledhbarani / Yamada, 2010’ [printed, red square] (TKPM).

**Additional material examined.** INDIA: KARNATAKA: Bangalore, Attur, x.2014, 1 ♂ 3 ♀♀♀, from Magnolia champaka (L.) Balf. ex Pierre (TKPM).
Distribution in India. Karnataka: Attur (this paper), Bangalore (Yamada et al. 2010a).

General distribution. Endemic.

Biology. The species inhabits plantations of Bauhinia purpurea, feeding on mealybugs Ferrisia virgata Cockrell, 1893. Observed as a potential predator of Phenacoccus solenopsis Tinsley, 1898 and Paracoccus marginatus Williams & Granara, 1992 (Yamada et al. 2010a). The specimens were also collected from the Champaka tree, Magnolia champaca (this paper).


Distribution in India. Tamil Nadu: Nilgiri Hills, Ooty (Muraleedharan 1977b).

General distribution. Endemic.

Genus Galchana Distant, 1910

Galchana humeralis Distant, 1910

Galchana humeralis Distant, 1910: 298. Syntype(s): ♀, India, Shimla (BMNH).


Distribution in India. Himachal Pradesh: Shimla (DISTANT 1910).

General distribution. Endemic.

Genus Temnostethus Fieber, 1860

Temnostethus (Ectemnus) paradoxus


Type material examined. Holotype: ♀, ‘Type / H. T.’ [printed circle with red border], ‘Simla’ [handwritten], ‘Type’ [printed circle with red border], ‘Found feeding / on Pineus on / Pine’ [handwritten], ‘CIBC-15’ [handwritten], ‘93’ [printed], ‘Temnostethus / raoi sp. n. / M.S.K. Ghauri det. 1965’ [handwritten + printed], ‘Pres by / Com Inst Ent / B M 1965-3’ [printed] (BMNH).

Distribution in India. Meghalaya: Shillong (Ghauri 1965).


Biology. Tetraphleps raoi is reported to inhabit Benguet pine (Pinus kei), feeding on Pineus sp. (Adelgidae) (Ghauri 1965, Chacko 1973). This species was sent from India to Kenya for release against Pineus pini (Macquart, 1819) on several Pinus spp. Karanja & Aloo (1990) reported that it established there, and it resulted in the decline of P. pini population.

Tribe Blaptostethini Carayon, 1972

Genus Blaptostethus Fieber, 1860

Blaptostethus kumbi Rajasekhara, 1973


Distribution in India. Karnataka: Mandya (Rajasekhara 1973); New Delhi (Rajasekhara 1973); Tamil Nadu (Muraleedharan 1977b).

General distribution. Endemic.

Biology. Unlike most species of the genus which inhabit dead plant materials such as clusters of vegetable refuse and the nests of weaverbirds (Yamada 2008a), the species was reported to inhabit sugarcane leaves (Rajasekhara 1973), however no further details regarding its biology were provided in the paper.

Blaptostethus pallescens Poppius, 1909

(Figs 16–17, 22–24)


Blaptostethus pallescens: Carayon (1972a): 329 (upgraded to species rank).

Material examined. INDIA: KARNATAKA: Bangalore, unknown date and collector, 17 ♂♂ 9 ♀♀ (TKPM, NBAIR).
**Distribution in India.** Karnataka: Bangalore (BALLAL et al. 2009); Maharashtra: Mumbai (POPPUS 1909); Tamil Nadu: Madras [= Chennai], Coimbatore (MURALEEDHARAN 1977b).

**General distribution.** Réunion (CARAYON 1958b, as Lasiocochiloides pleneti), Egypt (TAWFIK & EL-HUSSEINI 1971), East Africa (PERICART 1996), Madagascar (PERICART 1996).

**Biography.** The species inhabits corn (Zea sp.), Terminalis bellarica, Tithonia diversifolia, and castor bean plant (Ricinus communis) and is found associated with the aphid Rhopalosiphum maidis (Fitch, 1856), thrips and the two-spotted spider mite Tetranychus urticae Koch, 1836. This predator has also been evaluated as a biocontrol agent and potential predator of the maize stem borer, Chilo partellus (Swinhoe, 1885), and Tetranychus urticae (JALALI & SINGH 2002; BALLAL et al. 2003a, 2009) and the mealybugs Phenacoccus solenopsis and Paracoccus marginatus (BALLAL et al. 2012b). It has also been recently collected from Spathodea campanulata (rain-drop tree) and from dry fallen leaves and flowers. TAWFIK & EL-HUSSEINI (1971) reported that this species was commonly found on corn and fed on a variety of insects and mites.

**Blaptostethus pluto** (Distant, 1910) comb. nov.


**Type material examined.** *Lectotype* (present designation): ?, “Type / H. T.” [printed circle with red border], ‘under leaf / space of bamboo / Calcutta / 17-IX-09’ [handwritten], ‘Distant Coll. / 1911–383’ [printed], ‘Triphleps / pluto / Dist’ [Distant’s handwritten] (BMNH).

**Distribution in India.** West Bengal: Kolkata (DISTANT 1910).

**General distribution.** Endemic.

**Biography.** According to the attached label, the type specimen was found under leaf space of bamboo, which is similar to the preferable habitat of *Blaptostethus* species.

**Taxonomy.** While studying the syntype, it became obvious that this species should be transferred to *Blaptostethus* based on the following character combination: labium reaching mid coxae; profemur enlarged and with four long spines on anteroventral surface; ostiolar peritreme curved anteriorly and not reaching anterior margin of metapleuron.

**Genus Blaptostethoides Carayon, 1972**

*Blaptostethoides* sp. (Fig. 6)


**Distribution in India.** Karnataka: Mandya (this paper).

**Biography.** The specimens were collected from sugarcane plants (this paper).

**Remarks.** Judging from the male genitalia, this species is considered to be undescribed. However, there is only a single male available and it is in a bad condition. We refrain from describing it as a new species until enough material is available.

**Tribe Cardiastethini Carayon, 1972**

**Genus Alofa Herring, 1976**

*Alofa sodalis* (White, 1879)


**Distribution in India.** No detailed locality given (NASSER & ABDURAHIMAN 1990, as *Buchananiella sodalis*).

**General distribution.** This species is widespread throughout the tropics and subtropics of the world: tropical Africa, Pacific Islands, North, Central and South America, West Indies (CARAYON 1958a, CARPINTERO 2002, LATIN 2007). It is considered to be native to the Hawaiian Islands (LATIN 2007).

**Genus Amphiareus Distant, 1904**

*Amphiareus constrictus* (Stål, 1860) (Fig. 1)


**Distribution in India.** Karnataka: Mandya (this paper); Kerala: Kottayam, Thekkady, Trivandrum (MURALEEDHARAN & ANANTHAKRISHNAN 1978a); Meghalaya: Garo Hills, Khasi Hills reg., Shillong peak, 1850 m, 25°32′52″N 91°52′5″E, 4.–5.vi.1996, 1 ♀, E. Jendeck & O. Šauša lgt. (NMPC). TAMIL NADU: Nilgiris, Wellington Ooty, 1 ♀ 1 ♂, 16.ii.2016, C. R. Ballal (NBAIR).


**Biography.** The species is widely distributed, generally occurring in hay stacks, sheats of palms, nests of birds and leaf litter. It feeds on thrips Apelauenthrips con-similis (Ananthakrishnan, 1969) (MURALEEDHARAN & ANANTHAKRISHNAN 1978a). In Karnataka, it was recorded from sugarcane and mango, and found associated with thrips and mites (this paper).

**Amphiareus ruficollaris** Yamada & Hirokawata, 2003


**Distribution in India.** Meghalaya: Khasi Hills; Tamil Nadu: Nilgiris, Wellington Ooty. New record from India.

**General distribution.** Japan (YAMADA & HIROWATARI 2003), Laos, Malaysia, Thailand, Vietnam (YAMADA 2008b).

**Biography.** The specimens from Tamil Nadu were collected from Lantana sp. (this paper).
Genus Buchananiella Reuter, 1884

Buchananiella crassicornis Carayon, 1958


General distribution. Ivory Coast (CARAYON 1958a), Japan (YAMADA & HIROWATARI 2003), Malaysia (YAMADA & HIROWATARI 2007a), Thailand (YAMADA & HIROWATARI 2007a), Oman (CARAPEZZA et al. 2014), United Arab Emirates (CARAPEZZA et al. 2014). Biology. The species is reported to feed on mealybug Saccharicoccus sacchari (Cockrell, 1895) and Lepidopteran pests Opisia arenosella (Linnaeus, 1758) and Corycyra cephalonica (Stainton, 1866) (YAMADA et al. 2008). Recently collected from thrips-infested mulberry plants in Salem (this paper).

Buchananiella garoensis Muraleedharan, 1977


Distribution in India. Meghalaya: Garo Hills, Songsak (MURALEEDHARAN 1977a).

General distribution. Endemic.

Buchananiella indica Muraleedharan, 1977


Material examined. INDIA: Tamil Nadu: Salem, iv.2015, 1 ♀ (TKPM).

Distribution in India. Kerala: Kozhikode, Thikkodi (YAMADA et al. 2008); Tamil Nadu: Salem (this paper).


Biology. The species is reported to feed on mealybug Coccus variabilis Linnaeus, 1758 (CARAYON 1957), Coccus quercuslaetus (Trybom, 1910) (YAMADA et al. 2008); Tamil Nadu: Madras [= Chennai] (MURALEEDHARAN & ANANTHAKRISHNAN 1978a). General distribution. Tanzania (POPPIS 1909), United Arab Emirates (CARAPEZZA et al. 2014). Biology. The species is known to inhabit onion, sesame, Ficus and mango plantations and is found associated mostly with Orthaga exvinacea Hampson, 1891; Opisia arenosella, Corycyra cephalonica (Stainton, 1866); Thrips tabaci Lindeman 1889; T. palmi Karny, 1925, and Frankliiniella schultzei (Trybom, 1910) (POPPIS 1909, YAMADA et al. 2008). Recorded feeding on colonies of Hemiberlesia lataniae infesting agave (this paper).

Buchananiella pseudococci pseudococci

(Wagner, 1951)

Cardiastethus pseudococci pseudococci Wagner, 1951: 143. HOLOTYPE: ♂, Egypt, Cairo, Montaza (coll. Ministry of Agriculture, Cairo, Egypt).


Material examined. INDIA: Tamil Nadu: Salem, iv.2015, 1 ♀ (TKPM).

Distribution in India. Kerala: Kozhikode, Thikkodi (YAMADA et al. 2008); Tamil Nadu: Salem (this paper).

Genus Cardiastethus Fieber, 1860

Cardiastethus affinis Poppius, 1909

(Card 15)


Material examined. INDIA: KARNATAKA: Bangalore, 18.xii.2015, 1 ♀ (TKPM); Kunigal, viii.2016, 1 ♀ (TKPM).

Distribution in India. Karnataka: Bangalore, Kunigal (this paper); Kerala: Kuzhalmannam, Palakkad (YAMADA et al., 2008); Tamil Nadu: Madras [= Chennai] (MURALEEDHARAN & ANANTHAKRISHNAN 1978a).

General distribution. Tanzania (POPPIS 1909), United Arab Emirates (CARAPEZZA et al. 2014). Biology. The species is known to inhabit onion, sesame, Ficus and mango plantations and is found associated mostly with Orthaga exvinacea Hampson, 1891; Opisia arenosella, Corycyra cephalonica (Stainton, 1866); Thrips tabaci Lindeman 1889; T. palmi Karny, 1925, and Frankliiniella schultzei (Trybom, 1910) (POPPIS 1909, YAMADA et al. 2008). Recorded feeding on colonies of Hemiberlesia lataniae infesting agave (this paper).

Cardiastethus exiguis Poppius, 1913

(Figs 13, 19–21)


Cardiastethus pygmaeus pauliani: CARAYON (1957): 168 (downgraded to subspecies rank).


Distribution in India. Andhra Pradesh: Tirupathy (MURALEEDHARAN & ANANTHAKRISHNAN 1978a, as C. pygmaeus pauliani); Karnataka: Bangalore (this paper); Kerala: Thekkady (MURALEEDHARAN & ANANTHAKRISHNAN
1978a, as *C. pygmaeus pauliani*); Tamil Nadu: Madras [= Chennai], Dharmapuri, Salem (MURALEEDHARAN & ANANTHAKRISHNAN 1978a); West Bengal: Sagar Hills (MURALEEDHARAN 1975).

**General distribution.** Tropical Africa, China, Japan, Korea, Taiwan, Thailand (AUKEMA et al. 2013, JUNG et al. 2013).

**Biology.** Our observation reveals that *C. exigus* was
collected from coconut, papaya, dry fruits of jamun (Syzygium cumini), Aristolochia indica, and Cassia auriculata. It is also observed to feed on eggs of Opisina arenosella, Corcyra cephalonica, Orthaga exvinacea, Anadevidia peponis (Fabricius, 1775), and papaya mealybug (Paracoccus marginatus).

**Cardiastethus kathmandu Yamada, 2016**


**Material examined. INdia: Uttarakhand:** Bhimtal, 4 ♀♂, 5 ♀♂, 10.xi.2016, C. R. Ballal (NBAIR).

**Distribution in India.** Uttarakhand. New record from India.

**General distribution.** Nepal (Yamada 2016). Biology. The specimens were collected from Peltophorum sp.

**Genus Indocoris**

*Muraleedharan & Ananthakrishnan, 1978*

**Indocoris tarsatus**

*Muraleedharan & Ananthakrishnan, 1978*


**Distribution in India.** Tamil Nadu: Courtallami (MURALEEDHARAN & ANANTHAKRISHNAN 1978a).

**General distribution.** Endemic. Biology. The type series was collected from leaf galls of Vitis sp. (MURALEEDHARAN & ANANTHAKRISHNAN 1978a).

**Genus Orthosoleniopsis Poppius, 1909**

**Orthosoleniopsis carayoni**

*(Muraleedharan & Ananthakrishnan, 1974)*

*Buchananiella carayoni* Muraleedharan & Ananthakrishnan, 1974b: 34. HOLOTYPE: India, Keral a, Tenmalai (ZSI).


**Distribution in India.** Kerala: Tenmalai (MURALEEDHARAN & ANANTHAKRISHNAN 1974b, 1978a).

**General distribution.** Endemic.

**Genus Physopleurella Reuter, 1884**

**Physopleurella armata Poppius, 1909**

*(Fig. 3)*

*Physopleurella armata* Poppius, 1909: 12. SYNTYPES: 2 ♀♂, Japan, Buk enji (HNHM); unknown number of specimens, New Guinea, Haveri (MCSN).

**Material examined. INDIA: Karnataka:** Kunigal, viii.2016, 1 ♀ (TKPM).

**Distribution in India.** Karnataka: Kunigal. New record from India.


**Biology.** In India it was collected from coconut leaflets (this paper).

**Physopleurella flav a Carayon, 1956**


**Material examined. INDIA: Karnataka:** Bangalore 1 ♀, 2 ♀♀, 7.vi.2010, C. R. Ballal (NBAIR).

**Distribution in India.** Karnataka: Bangalore. New record from India.


**Biology.** The specimens were collected from dry leaves and fruits of Ficus sp.

**Physopleurella indica Muraleedharan & Ananthakrishnan, 1978**


**Material examined. INDIA: Karnataka:** Chikkamagaluru, Mudigere v.2015, 1 ♀ (TKPM).

**Distribution in India.** Karnataka: Chikkamagaluru (this paper); Kerala: Thenmalai (MURALEEDHARAN & ANANTHAKRISHNAN 1978a).

**General distribution.** Endemic.

**Physopleurella loyola Muraleedharan & Ananthakrishnan, 1978**

*Physopleurella loyola* Muraleedharan & Ananthakrishnan, 1978a: 68. HOLOTYPE: India, Madras [= Chennai], Loyola College Campus (ZSI).

**Distribution in India.** Tamil Nadu: Chennai (MURALEEDHARAN & ANANTHAKRISHNAN 1978a).

**General distribution.** Endemic.

**Physopleurella pessoni Carayon, 1956**


**Material examined. INDIA: Tamil Nadu:** Palani hills, 2 ♀♂, 1 ♀ (TKPM, NBAIR).

**Distribution in India.** Tamil Nadu: Palani hills. New record from India.

**General distribution.** Cameroon (CARAYON 1956), Ivory Coast (CARAYON 1956), Mozambique (CARAYON 1956), Madagascar (CARAYON 1958b), Mauritius (CARAYON 1958b), Peninsular Malaysia (YAMADA & HIROWATARI 2007b), Indonesia (Bali) (YAMADA & HIROWATARI 2011).

**Remarks.** *Physopleurella pessoni* is the only known viviparous species in the family Anthocoridae (CARAYON 1956).
Physopleurella vichitravarna Muraleedharan, 1977


Distribution in India. Meghalaya: Garo Hills, Dainadubi, Songsak (MURALEEDHARAN 1977a).

General distribution. Endemic.

Genus Rajburicoris Carpintero & Dellapé, 2008

Rajburicoris keralanus Yamada, 2010


General distribution. Endemic.

Biology. The species is known to inhabit black pepper plantations and feeds on Liothrips karnyi (Bagnall, 1924) (YAMADA et al. 2010b).

Rajburicoris stygi Carpintero & Dellapé, 2008


Distribution in India. Tamil Nadu: Palani hills. New record from India.


Tribe Oriini Carayon, 1958

Genus Bilia Distant, 1904

Bilia burma Yasunaga & Yamada, 2016


Distribution in India. Himachal Pradesh: Shimla; Karnataka: Kanakapura. New record from India.


Biology. The specimens were collected on egg plants (Solanum melongena) and weed Rubus ellipticus (this paper).

Bilia castanea (Carvalho, 1951)


Type material examined. HOLOTYPE: ♂, ‘Type’ [printed circle with red border], ‘n.s.’ [handwritten], ‘S. India: / Nandidrug Hill. / 4,500 feet’ [printed], ‘Pres. by / Dr. T. V. Campbell. / B.M.1928-189’ [printed], ‘Biliola / castanea n. sp. / J.C.M. Carvalho det. 1951’ [handwritten + printed] (BMNH).

Distribution in India. Karnataka: Bangalore, Nandi Hills (CARVALHO 1951, YASUNAGA et al. 2016b); Tamil Nadu: Hosur, Salem (this paper); West Bengal (GHOSEH et al. 1981).

General distribution. China (Hainan), Taiwan (PERCART 1996, BU & ZHENG 2001).

Biology. The species inhabits plantations of Brassica nigra, grape (Vitis sp.), Nyctanthes arbor-tristis, Zizyphus, mulberry (Morus sp.), brinjal (Solanum melongena) and is reported to feed on thrips, the aphid Lipaphis erysimi (Kaltenbach, 1843) and the two spotted spider mite Tetranychusurticae (GHOSEH et al. 1981, BALLAL & YAMADA 2016). This species has also been observed feeding on aphis and the eggs and nymphs of cicadellids (CARAYON & MIYAMOTO 1960).

Bilia fraca Distant, 1904

Bilia fraca Distant, 1904: 480. SYNTYPE(s): Sri Lanka, Peradeniya (BMNH).

Type material examined. SYNTYPE: ♀, ‘Type / H. T.’ [printed circle with red border], ‘Peradeniya, / Ceylon, 9.03’ [printed + handwritten], ‘Distant Coll. / 1911-383’ [printed], ‘Bilia / fraca Dist’ [handwritten] (BMNH).

Distribution in India. No Indian state given (MURALEEDHARAN & ANANTHAKRISHNAN 1978b).


Genus Carayonocoris Muraleedharan, 1977

Carayonocoris indicus Muraleedharan, 1977

(Fig. 9)


Material examined. INDIA: KARNATAKA: Bangalore, Chikballapur, is.2014, 1♀(TKPM); Bangalore, iii.2015, 1♀ (TKPM).

Distribution in India. Karnataka: Bangalore, Chikballapur (this paper); Kerala: Nilambur (MURALEEDHARAN 1977c); Punjab (MURALEEDHARAN & ANANTHAKRISHNAN 1978b); Tamil Nadu: Madras [= Chennai] (MURALEEDHARAN 1977c).

General distribution. Endemic.

Biology. This species is anthophilous, recorded on Cassia javanica, C. rosea, and C. auriculata (this paper). It is associated with mites and thrips, e.g. Haplothrips ganglbaueri Schmutz, 1913 and Frankliniella schultzei (MURALEEDHARAN & ANANTHAKRISHNAN 1978b, ANANTHAKRISHNAN & SURESHKUMAR 1985).

Genus Montandoniola Poppius, 1909

Montandoniola bellatula Yamada, 2007


Material examined. INDIA: KARNATAKA: Bangalore Rural, Ghati Subramanya, ii.2015, 1♀ (TKPM).

Distribution in India. Karnataka: Bangalore. New record from India.

General distribution. Indonesia: Bali (YAMADA et al. 2007).

Biology. The species was collected from Butea monosperma and found associated with thrips (this paper).

Montandoniola indica Yamada, 2011

(Fig. 7)


Distribution in India. Andhra Pradesh (MURALEEDHARAN & ANANTHAKRISHNAN 1978b, as M. moraguesi); Karnataka: Bangalore, Magadi, Mercara, Ghati Subramanya (this paper); Kerala: Malappuram, Palakkad, Wynaad (MURALEEDHARAN 1977b, as M. moraguesi; MURALEEDHARAN & ANANTHAKRISHNAN 1978b, as M. moraguesi; YAMADA et al. 2011); Maharashtra: Panchgani (MURALEEDHARAN & ANANTHAKRISHNAN 1978b, as M. moraguesi); Tamil Nadu: Madras [= Chennai], Courtallam, Hosur, Kodaikanal, Tambaram, Yercaud (MURALEEDHARAN 1977c, as M. moraguesi; MURALEEDHARAN & ANANTHAKRISHNAN 1978b, as M. moraguesi); Uttar Pradesh: Dehra Dun (MURALEEDHARAN & ANANTHAKRISHNAN 1978b, as M. moraguesi); West Bengal: Kolkata (MURALEEDHARAN & ANANTHAKRISHNAN 1978b, as M. moraguesi; BALLAL et al. 2012a).

General distribution. Endemic.

Biology. The species inhabits different plants such as black pepper (Piper nigrum), Ficus and Terminalia chebula and preys on variety of insects including gall makers, Gynai-kothrips flaviantennatus Moulton, 1929; G. bengalensis Ananthakrishnan, 1973; G. uzelli Zimmermann, 1900; Schedothrips orientalis Ananthakrishnan, 1968; Liothrips karnyi Bagnall, 1914 (MURALEEDHARAN & ANANTHAKRISHNAN 1971, 1978b; ANANTHAKRISHNAN & VARADARASAN 1977; DEVASAHYAM & KOYA 1994; DEVASAHYAM 2000; YAMADA et al. 2011; BALLAL et al. 2012a; BALLAL & YAMADA 2016). This species was collected from jamun (Syzygium cumini), bastard teak (Butea monosperma), mulberry (Morus sp.) and observed to be associated with several thrips species including Megalurothrips sp. and mealybug species, viz. Planococcus citri (this paper). Recorded feeding on Gynai-kothrips uzelli infesting Ficus retusa (BALLAL et al. 2012a).

Comment. PLIOT-SIGWALT et al. (2009) reviewed the specimens of Montandoniola from different parts of the world. They concluded that several species were confused under the name M. moraguesi and that true M. moraguesi is restricted to the Mediterranean region and Africa.

Genus Odontobrachys Fieber, 1860

Odontobrachys niger Fieber, 1860

Odontobrachys niger Fieber, 1860: 270. SYNTYPE(s): India (depository not stated).
Distribution in India. No Indian state distribution provided (Fieber 1860, Distant 1906, Muraleedharan & Ananthakrishnan 1978b, Ford 1979).

General distribution. Endemic.

Genus Orius Wolff, 1811

Orius (Orius) bifilaris Ghauri, 1972

Orius (Orius) bifilaris Ghauri, 1972a: 418. Holotype: , Pakistan, Rawalpindi (BMNH).

Type material examined. Holotype: , ‘Holo-/type’ [printed circle with red border], ‘Nymph feeding mite on / Cannabis sativa’ [handwritten], ‘Rawalpindi / 15.i.64’ [handwritten]. ‘C.I.B.C. / M.15.i. 64-1’ [handwritten], ‘47’ [handwritten], ‘C.I.E. COLL. / No. 19850’ [printed + handwritten], ‘Pres by / Com Inst Ent / B M 1972-2’ [printed], ‘Orius (O.) / bifilaris sp. n. / M.S.K. Ghauri det. 1972’ [handwritten + printed] (BMNH).

Distribution in India. Punjab: Jalandhar (Ghauri 1972a); Uttar Pradesh (Veer 1984).


Biology. The species was found on number of plant species, reported to feed on mites, thrips and aphids, namely Aphis gossypii Glover, 1877 and Thrips flavus Schrank, 1776 (Ghauri 1972a, Veer 1984).

Orius (Orius) lindbergi Wagner, 1952


General distribution. Canary Island, France, Italy (Sicily), Morocco, Portugal, Spain, Tunisia (Pericart 1996).

Biology. Reported to feed on species of several aphid genera (Bhagat 2015).

Orius (Orius) niger (Wolff, 1811)


Orius niger: Schuhmacher (1922): 338 (new combination).


Material examined. INDIA: KARNATAKA: Tumkur, Devarayanadurga, viii.2016, 2 ♀♂ 1 ♂ (TKPM); Kanakapura, x.2016, 3 ♀♂ 6 ♀♂ (NBAIR).

Distribution in India. Himachal Pradesh (Ghauri 1972a); Karnataka (Ballal & Yamada 2016); Tamil Nadu: Madras [= Chennai], Tambaram (Muraleedharan 1977b, as O. n. aegyptiacus).


Biology. The species has been seen on jasmine plants, Tecoma stans, and Butea monosperma, where it is associated with thrips (Devi & Gupta 2010, Ballal & Yamada 2016). In the Palaearctic Region, this species is well known as a predator of aphids, thrips, and eggs of Lepidoptera, pentatomids, and mites (Carayon & Steffan 1959, Pericart 1972).

Orius (Orius) shyamavarna

Muraleedharan & Ananthakrishnan, 1974


Distribution in India. Karnataka: Bangalore (Muraleedharan & Ananthakrishnan 1974a); Kerala: Munnar (Muraleedharan & Ananthakrishnan 1974a).

General distribution. Endemic.

Biology. It was collected from Butea monosperma, on which it is associated with thrips (this paper).

Orius (Orius) trivandrensis

Muraleedharan & Ananthakrishnan, 1974


General distribution. Endemic.

Orius (Dimorphella) dravidiensis

Muraleedharan, 1977

Orius (Heterorius) dravidiensis Muraleedharan, 1977b: 234. Holotype: , India, Tamil Nadu, Tanjore (ZSI).

Orius (Dimorphella) dravidiensis: Yamada et al. (2016b): 1148 (subgeneric placement).

Material examined. INDIA: KARNATAKA: Bangalore, Attur, i.2013, on mango tree, 2 ♀♂ (TKPM); Bangalore, Hebbel, iii.2012, 1 ♀♂ (NBAIR); Kanakapura, xii.2013, 1 ♀♂ (NBAIR); Bangalore outskirts, Savandurga, vi.2015, 1 ♀ (TKPM, NBAIR).

Distribution in India. Karnataka: Attur, Hebbel, Kanakapura, Savandurga (this paper); Tamil Nadu: Tanjore (Muraleedharan 1977b).


Biology. In India, this species has been collected from Peltophorum ferrugineum, mango (Mangifera indica), Butea, Pongamia, Cassia rosea, Lagerstromia, mulberry (Morus spp.), Acacia dealbata, and was associated with thrips (this paper).

Orius (Dimorphella) latibasis

Ghauri, 1972


Type material examined. Holotype: , ‘Holo-/type’ [printed circle with red border], ‘collected in the cage of / aphids on Bitter Gourd’ [handwritten], ‘Bangalore / 10. xii. 64’ [handwritten], ‘collected in the cage of / aphids on Bitter Gourd’ [handwritten + printed, ones place digit of the year undescribed], ‘Pres by / Com Inst Ent / B M 1972-2’ [printed], ‘Orius (D.) / latibasis sp. / M.S.K. Ghauri det. 1965’ [handwritten + printed], ‘Orius (Dimorphella) / latibasis sp. n. / M.S.K. Ghauri det. 1977’ [handwritten + printed, ones place digit of the year undescribed], ‘Pres by / Com Inst Ent / B M 1972-2’ [printed] (BMNH).

Distribution in India. Karnataka: Bangalore (Ghauri 1972a).

General distribution. Endemic.

Biology. The species is known to feed on aphids on bitter gourd (Momordica charantia) (Ghauri 1972a).
**Orius (Dimorphophila) maxidentex Ghauri, 1972**


*Orius (Dimorphophila) maxidentex* Ghauri, 1972a: 414. **Holotype:** $\vartriangle$, Pakistan, Hangu (BMNH).

**Type material examined.** **Holotype:** $\vartriangle$, ‘Holotype / type’ [printed circle with red border], ‘1353’ [handwritten], ‘adult on Eriobotrya japonica’ [handwritten], ‘Hangu / 9.12.62’ [handwritten], ‘C.I.B.C. / PF. 1262-30’ [handwritten], ‘Pres by / Com Inst Ent / B M 1972-2’ [printed], ‘Orius (Dimorphophila)/maxidentex sp. n. / M.S.K. Ghauri det. 1972’ [handwritten printed] (BMNH).

**Additional material examined.** **INDIA:** **Andaman Nicobar Islands:** Suppighat, iii.2012, 4 $\vartriangle$ (TKPM, NBAIR), **Karnataka:** Dharwad, v.2016, 1 $\vartriangle$ (TKPM); Kunigal, 3.iv.2014, 1 $\vartriangle$ (TKPM).

**Distribution in India.** Andaman Nicobar Islands (this paper); Karnataka: Bangalore, Kanakapura, Mysore, (Ghauri 1972a), Kunigal (this paper); New Delhi (Ghauri 1972a); Tamil Nadu: Coimbatore, Kovilpatti (Ghauri 1972a, Muralleedharan & Ananthakrishnan 1978b, Kumar & Ananthakrishnan 1984, Ananthakrishnan & Sureshkumar 1985, Thontadarya & Rao 1987, Ballal & Yamada 2016). *Orius maxidentex* was recorded on black gram, watermelon plant, Wedelia trilobata, castor, cashew, Butea sp., Cassia fistula, Justice, Albizia, and is associated with thrips species (this paper).

**Orius (Dimorphophila) tantillus** (Motschulsky, 1863)

(Fig. 14)

*Anthocoris tantillus* Motschulsky, 1863: 89. **Neotype** (designated by Ghauri 1972a: 414); Sri Lanka, Pandulale-oya (BMNH).

*Orius tantillus* Ghauri (1972a): 411 (redescription).


**Material examined.** **INDIA:** **Arunachal Pradesh:** Pasighat, v.2014, 4 $\vartriangle$ (TKPM, NBAIR), **Maharashtra:** 40 km W. of Pune, Muishi env., 30.ix.-2.x.2005, 5 $\vartriangle$ (TKPM); 70 km S. of Pune, Bai ling env., 30.ix.-2.x.2005, 5 $\vartriangle$ (TKPM); 25°01′13″N 76°21′47″E, 359 m, 24.-26.iii.2004, 1 $\vartriangle$ (TKPM). **Distribution in India.** Arunachal Pradesh: Pasighat (this paper); Gujarat: Anand (this paper); Karnataka: Bangalore, Mandy, Mysore (Muralleedharan & Ananthakrishnan 1974a); Maharashtra (this paper); Rajasthan: Alwar (this paper); Tamil Nadu: Coimbatore (Ghauri 1972a).

**General distribution.** Iran (Ghauri et al. 2009), Sri Lanka (DISTANT 1906), Cambodia, Thailand (Yamada et al. 2016b), Malaysia (Manley 1976), China (Bu & Zheng 2001), Taiwan (Yasunaga 1997), Japan (Yamada et al. 2016b); Australia (Ghauri 1972a, Postle et al. 2001), Solomon Islands (Ghauri 1972a), Micronesia (Herreng 1967, Ghauri 1972a); Kenya, Nigeria, Tanzania (Hernandez & Stonedahl 1999).

**Biology.** The species inhabits chilli, pepper, tea, rice, groundnut, Sesbania, bajra (*Pennisetum glaucum*), Chrysanthemum, Dahlia, marigold, cotton, and feeds on thrips such as *Thrips tabaci*, *Scirtothrips dorsalis*, *Baliothrips biformis* (Bagnall, 1984), *Caliothrips indicus* (Bagnall 1913), *Microcephalothrips abdominalis* (Crawford, 1910), and *Haplothrips ganglbaueri* (Ghauri 1972a, Ballal & Yamada 2016). It was also collected from dry flowers of sugarcane where it was feeding on thrips (this paper).

**Orius (Heterorius) minitus Linnaeus, 1758**


For further synonyms and references of this species, see Péricart (1996) and Bu & Zheng (2001).

**Material examined.** **INDIA:** **Arunachal Pradesh:** Pasighat, v.2014, 3 $\vartriangle$ (TKPM, NBAIR).

**Distribution in India.** Arunachal Pradesh: Pasighat (this paper); Jammu and Kashmir: Kashir (Bhagat 2015); Tamil Nadu (Viswanathan & Ananthakrishnan 1974).


**Biology.** The species has been reported from quickstick (Glicridia septum) feeding on the thrips *Taeniothrips distalis* Karny, 1913, *Frankliniella schultzei*, *Haplothrips ganglbaueri*, and several aphid species (Viswanathan & Ananthakrishnan 1974, Bhagat 2015, Ballal & Yamada 2016).

**Orius amnesius Ghauri, 1980**

*Orius amnesius* Ghauri, 1980: 288. **Holotype:** $\vartriangle$, Nigeria, Kaduna State, Yankara (BMNH).

**Material examined.** **INDIA:** **Karnataka:** Bangalore, xi.2012, on rose flower, 1 $\vartriangle$ (TKPM).

**Distribution in India.** Karnataka: Bangalore (Ballal & Yamada 2016).

**General distribution.** Nigeria (Ghauri 1980).

**Biology.** The species was reported as a predator of *Megalurothrips sjostedti* (Trybom, 1910) infesting cowpea (*Vigna unguiculata*) (Ghauri 1980). In India it was recorded on rose plant (*Rosa sp.*).

**Note.** The subgeneric placement of the species has not been established yet.

**Orius sublaevis** (Poppius, 1909)

*Trichleps sublaevis* Poppius, 1909: 36. **Synotypes:** China, Sichuan, Taschuiwan-Ljuigupin (ZMAS); India, Darjeeling (NHMW); Indonesia, Sumatra, Si-Rambé (MCSN, MZHF).


**Distribution in India.** West Bengal: Darjeeling (Poppius 1909, Distant 1910).

**General distribution.** China (Sichuan), Indonesia (Sumatra) (Poppius 1909).

**Note.** The subgeneric placement of the species has not been established yet (Péricart 1996).
**Orius ianthe (Distant, 1910)**


**Orius ianthe**: GHAURI (1972a): 409 (treated as *Orius* without any comment on the new generic combination).

**Type material examined.** **Holotype**: sex unknown, ‘Type / H. T.’ [printed circle with red border], ‘Calcutta’ [handwritten], ‘Triphleps / ianthe Dist.’ [handwritten], ‘Distant Coll. / 1911-383’ [printed]; pinned, abdomen lost (BMNH).

**Distribution in India.** West Bengal: Kolkata (DISTANT 1910, GHAURI 1972a).

**General distribution.** Endemic.

**Note.** The subgeneric placement of the species has not been established yet.

**Orius indicus** (Reuter, 1884)


**Orius indicus**: GHAURI (1972a): 409 (treated as *Orius* without any comment on the new generic combination).

**Distribution in India.** Kerala: Calicut (= Kozhikode) (MURALEEDHARAN & ANANTHAKRISHNAN 1974a); Tamil Nadu: Madras (= Chennai), Kovalpatti (MURALEEDHARAN & ANANTHAKRISHNAN 1974a); West Bengal (GHAURI 1972a).

**General distribution.** Endemic.

**Biology.** The species is known to feed on thrips including *Gynaikothrips fucorum* (Marchal, 1908); *Scirtothrips dorsalis* Hood, 1919; *Megalurothrips nigricornis* (Schmutz, 1913), and *Taeniothrips nigricornis* (Schmutz, 1913) (RAJASEKHARA & CHATTERJI 1970, ANANTHAKRISHNAN & SURESHKUMAR 1985).

**Note.** The subgeneric placement of the species has not been established yet.

**Genus Pachytarsus** Fieber, 1860

*Pachytarsus crassicornis* Fieber, 1860

*Pachytarsus crassicornis* Fieber, 1860: 269. **Syntype(s)**: sex not indicated, ‘Ostindien’ [= East India] (MNHN).
Type material examined. **Syntype**: sex unknown, 'MUSEUM PARIS / COLL. NOUALHIER 1898' [printed], 'Pachytarsus / crassicornis / type Pieber / Index or.' [handwritten], 'type' [printed, red square], 'Pachytarsus / crassicornis / Pieb.' [Carayon’s handwritten]; pinned, abdomen lost (MNHN).

**Distribution in India.** East India (no locality given) (Distant 1906, Ford 1979).

**General distribution.** Endemic.

Tribe Scolopini Carayon, 1954

**Genus Scoloposcelis Fieber, 1864**

*Scoloposcelis asiaticus*

*Muraledharan* & *Ananthakrishnan*, 1974

*Scoloposcelis asiaticus* Muraledharan & Ananthakrishnan, 1974c: 511. **Holotype**: ‡, India, Tamil Nadu, Madras [= Chennai] (ZSI).

**Distribution in India.** Karnataka: Mysore (Muraledharan & Ananthakrishnan 1974c); Tamil Nadu: Chennai, Thimbam (Muraledharan & Ananthakrishnan 1974c).

**General distribution.** Endemic.

**Biology.** The species has been seen feeding on egg clusters and early instars of mycophagous thrips *Ecacanthothrips sanguineus* Bagnall, 1908 and on staphylinid larvae on decaying bark of *Erythrina* sp. (Muraledharan & Ananthakrishnan 1974c).

*Scoloposcelis contubernalis* (Distant, 1904)

*Ostoridus contubernalis* Distant, 1904a: 219. **Syntype(s)**: North West Himalayas (BMNH).


**Distribution in India.** North-western Himalayas (Distant 1904a).

**General distribution.** Endemic.

**Biology.** The type series has been reported to inhabit galleries of the beetle *Polygraphus* sp. in spruce-fir (Distant 1904a).

*Scoloposcelis parallela* (Motschulsy, 1863)


**Seselius parallela** (Distant 1904): 222 (new combination).

**Scoloposcelis parallela** Poppius (1909): 25 (new combination).

**Material examined.** **INDIA**: **KARNATAKA**: Alwar, Naranimata env., 27°08′4″E, 31°05′22″N, 1908 (ZSI).


**Biology.** It lives under the bark of fallen trees (mainly *Erythrina indica*), living among large colonies of *Ecacanthothrips sanguineus* and *Dinothrips sumatrensis* Bagnall, 1908, feeding on their eggs and larvae (Muraledharan 1977a, Muraledharan & Ananthakrishnan 1978b, Ballal & Yamada 2016).

Tribe Xylocorini Carayon, 1972

**Genus Xylocoris Dufour, 1831**

*Xylocoris (Arrostelus) ampoli* Yamada & Yasunaga, 2013

(Fig. 8)

*Xylocoris (Arrostelus) ampoli* Yamada & Yasunaga, 2013 in Yamada et al. (2013: 497). **Holotype**: ‡, Thailand, Suphan Buri Province, Sri Prakan (DOAT). Holotype was transferred from SUT to DOAT because continuous maintenance of the type specimens in SUT would become difficult (Yasunaga et al. 2016a).

**Type material examined.** **Holotype**: ‡, 'THAILAND: Suphan Buri / Sri Prakan / N14°41′18.3″ / E100°08′25.8″ / 10 m alt., 25.x.2008 / T. Yasunaga & K. Yamada leg. [printed]; 'Holotype // Xylocoris (Arrostelus) ampoli / Yamada & Yasunaga, 2013' [printed, red square] (DOAT).

**Additional material examined.** **INDIA**: Karnataka: Kanakapura, vi.2016, 8 14 14 (TKPM, NBAIR).

**Distribution in India.** Karnataka: Bangalore (Ballal & Yamada 2016), Kanakapura (this paper).

**General distribution.** Indonesia (East Kalimantan), Thailand (Yamada et al. 2013).

**Biology.** Reported from maize (*Zea mays*) plantations (Ballal & Yamada 2016) and cauliflower plants (this paper).

*Xylocoris (Arrostelus) flavipes* (Reuter, 1875)

(Figs 4, 18, 25–27)

Piezostethus flavipes Reuter, 1875: 65. **Lectotype** (designated by Pérciart 1970: 746, as ‘type’): ‡, Algeria, Biskara (MNHN).


For further synonyms and references of this species see Pérciart (1996).


**Distribution in India.** Andhra Pradesh (Ballal & Yamada 2016); Assam (Ballal & Yamada 2016); Himachal Pradesh (Ballal & Yamada 2016); Jammu and Kashmir (Ladakh) (Bhagat 2015); Karnataka: Bangalore, Hebbal (this paper); Kerala (Ballal & Yamada 2016); Rajasthan: Alwar (this paper); Sikkim (Ballal & Yamada 2016); Tamil Nadu (Ballal & Yamada 2016).

**General distribution.** Cosmopolitan, widespread mainly in the Old World tropics and subtropics and is assumed to be non-indigenous in the Oriental Region (Yamada et al. 2013). Occasionally introduced to storages in Europe and the USA (Henry 1988, CASSIS & GROSS 1995, Pérciart 1996, Carpietro 2002).

**Biology.** In India found mainly in stored grains like wheat and rice and feeds on several storage pests including *Tri- bolium castaneum* (Herbst, 1797) (Mukhherjee et al. 1971, Ballal & Yamada 2016) and bruchids. The species has been reported to predate on 13 species of insects belonging
to three orders (Arriogast 1976). In India, besides being recorded in storage bins and warehouses, also recorded on Butea monosperma, Ficus sp. and maize, found associated with Megalurothrips sp. and a few mealybugs (Planococcus citri) (this paper).

**Xylocoris (Proxylcoris) afer** (Reuter, 1884) 
(Fig. 5)


*Xylocoris afer* Pericart (1970): 748 (treated as *Xylocoris* without any comment on new generic combination).

*Xylocoris (Proxylcoris) afer* Carayon (1972b): 595 (new subgeneric placement).

**Material examined.** **INDIA:** **KARNATAKA:** Bangalore, Yelahanka, viii.2012, 2 ♀ 13 ♂ (TKPM, NBAIR).

**Distribution in India.** Karnataka: Bangalore (Ballal & Yamada 2016).

**General distribution.** Australia (Cassis & Gross 1995), Israel (Pericart 1996), New Guinea (Pericart 1996), subtropical and tropical Africa (Pericart 1996), tropical America (Carpintero 2002), Yemen (Linnavuori & Van Harten 2002).

**Biology.** Reported from the dry fruits of Ficus and Lagerstomia flos-reginae (Ballal & Yamada 2016).

**Xylocoris (Proxylcoris) cerealis** 
Yamada & Yasunaga, 2006

*Xylocoris (Proxylcoris) cerealis* Yamada & Yasunaga, 2006 in Yamada et al. (2006: 526). **Holotype:** ♀, Thailand, Songkhla Province, Ranode, rice mill factory (NIAES).

**Material examined.** **INDIA:** **KARNATAKA:** Bangalore, Yelahanka, vii.2015, 1 ♀ 1 ♂ (NBAIR). **RAJASTHAN:** 20 km N. of Dausa, Narain-mata env., 400 m, 27°05′46″N 76°17′18″E, 10.ix.2002, 1 ♀, P. Šrámek lgt. (NMPC).

**Distribution in India.** Karnataka: Bangalore; Rajasthan: Dausa, Alwar (this paper).


**Biology.** Reported from maize (Zea mays) plantations (Ballal & Yamada 2016).

**Incertae Sedis**

**Genus Crytosternum** Fieber, 1860

**Crytosternum flavicorne** Fieber, 1860

*Crytosternum flavicorne* Fieber, 1860: 265. **Syntype(s):** India (depository not stated).

**Distribution in India.** No Indian state distribution provided (Fieber 1860, Distant 1906).

**General distribution.** Endemic.

Family LASIOCHILIDAE Carayon, 1972

Tribe Lasiochilini Carayon, 1972

**Genus Dilasia Reuter, 1871**

**Dilasia corticalis** (Reter, 1884)

*Lasiocilus corticalis* Reter, 1884: 575. **Syntype(s):** India, Nikobar Island and Milo, Nankauri (ZMUC).


**Distribution in India.** Andaman and Nicobar Islands: Nicobar Islands, Milo Nankauri (Reuter 1884).

**General distribution.** Endemic.

**Dilasia indicia** (Muraleedharan, 1978) comb. nov.


**Distribution in India.** Tamil Nadu: Chennai (Muraleedharan 1978).

**General distribution.** Endemic.

**Taxonomy.** Muraleedharan (1978) originally described this species in the genus *Lasiocilus* Reuter, 1871. Judging from his description, the lack of punctures on hemelytra, strong spines on tibiae, and the shape of paramere are more conducive to its placement in *Dilasia*.

**Discussion**

A total of 73 species of anthocorid bugs, belonging to 26 genera under 8 tribes in 2 families (Anthocoridae and Lasiochilidae) are known to occur across vast areas of...
India. The eight tribes include Almeidini, Anthocorini, Blaptostethini, Cardiastethini, Oriini, Scolopini, Xylocorini of Anthocoridae, and Lasiochilini of Lasiochilidae. Among these, Cardiastethini is represented by 8 genera (Alofa, Amphiarus, Buchananiella, Cardiastethus, Indocoris, Orthosoleniopsis, Physopleurella, and Rajhuricoris), Oriini by 6 genera (Bilia, Carayonocoris, Montandoniola, Odontobrachys, Orius, and Pachytarsus), Anthocorini by 4 genera (Anthocoris, Galchana, Temnostethus, and Tetraplephes), Almeidini by two genera (Almeida and Lippomanus), Blaptostethini by 2 genera (Blaptostethus and Blaptostethoides), while the remaining tribes are represented by a single genus each: Scolopini (Scoloposcelis), Xylocorini (Xylocoris) and Lasiochilini (Dilasia). The most genera in terms of species are Orius (14), Anthocoris (8), Physopleurella (6), Xylocoris (6), and Buchananiella (4). Four genera, Bilia, Blaptostethus, Cardiastethus, and Scoloposcelis, are each represented by 3 species, while six genera, Amphiarus, Lippomanus, Montandoniola, Rajhuricoris, Tetraplephes, and Dilasia, are each represented by 2 species. Eleven genera, Almeida, Alofa, Carayonocoris, Cryptosternum, Galchana, Indocoris, Odontobrachys, Orthosoleniopsis, Pachytarsus, Temnostethus, and Blaptostethoides, are each represented by a single species. Six out of the 26 genera (Galchana, Indocoris, Carayonocoris, Cryptosternum, Odontobrachys, and Pachytarsus) and 28 out of the 73 species have so far been reported only from India. Habitus photographs of some of the anthocorids from India are provided (Figs 1–12). From India, several anthocorid species have been reported to have attained substantial control over several pest populations, like Orius maximipennis and O. tantillus on Helicoverpa armigera (Insecta: Lepidoptera); Cardiastethus exigus, C. affinis and Alofa sodalis on Opisina arenosella (Insecta: Lepidoptera); Blaptostethus pallescens on Chilo partellus (Insecta: Lepidoptera) and Tetranychus urticae (Acari: Tetranychidae); Anthocoris muraleedharanii on Ferrisia virgata (Insecta: Hemiptera); Montandoniola indica on Gynaikothrips uzeli (Insecta: Thysanoptera) and Xylocoris spp. on several stored grain pests (BALLAL & YAMADA 2016). Some of the images illustrating predatory behaviour of Indian anthocorids are provided (Figs 13–18). To enhance, production protocols and storage efficacy of anthocorids as promising biocontrol agents; studies on biology and rearing requirements of some of them have also been carried out (BALLAL et al. 2003a, 2012c, 2013; BALLAL & YAMADA 2016; KAUR & VIRK 2011) (Figs 19–27). However, considering that most of India is still unexplored for anthocorids, the true number of species and their potential as biocontrol agents are still unknown.

Acknowledgements

The financial assistance rendered by the Department of Science and Technology (DST/SP/YO/130/2017), Govt. of India, New Delhi to the corresponding author, and by the JSPS KAKENHI Grant (Nos. 25840150 and JP16K07502) to the third author (K. Yamada) is gratefully acknowledged. Sincere thanks to Dr. M. D. Webb (BMNH), Dr. D. Pluot-Sigwalt (MNHN), and Dr. T. J. Henry (USNM) for their help and hospitality during the third author’s visits to London, Paris and Washington, DC, and for permission to access material; to Dr. P. Kment (NMPC) for sending photos and label information of specimens. Thanks are extended to anonymous reviewers and again Dr. P. Kment (editor-in-chief of AEMNP) for improving the manuscript with invaluable comments and suggestions.

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Acta Entomologica Musei Nationalis Pragae, volume 58, number 1, 2018


