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The Dragonflies and Damselflies (Odonata) of Kerala – Status and Distribution

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ABSTRACT: The odonate fauna of Kerala, their status and distribution are reviewed. Based on personal records from field work since 2010 and published literature, all the recent additions and range extensions to the region are critically analyzed and a revised checklist of odonates of Western Ghats and Kerala is provided. The current checklist of odonates of the Western Ghats stands at 207 species, including 80 endemics. A total of 181 species of Odonates, including 68 Western Ghats endemics, belonging to 87 genera under two suborders and 14 families were recorded from the geographical boundary of Kerala. The suborder Zygoptera comprises 74 species of damselflies (30 genera in seven families) and the suborder Anisoptera has 107 species (57 genera in seven families). Endemic species and those in IUCN Red List categories are enlisted. None of the odonate species from the region are protected under the Indian Wildlife Protection Act (WPA) 1972. A detailed discussion on odonates occurring in Kerala has been provided in the systematic part.

KEY WORDS: Western Ghats, endemics, range extension, IUCN, Red List, WPA 1972

INTRODUCTION

Global diversity of odonates has been estimated at 6335 species classified in 693 genera (Paulson *et al.*, 2021) of this 493 species and 27 subspecies in 152 genera and 18 families are known to exist in India (Subramanian and Babu, 2020). One hundred and ninety five species group taxa, belonging to 69 genera are endemic to India and, high endemism is found in Western Ghats where it is concentrated mainly in the mountains south of Coorg in Karnataka and Kerala (Subramanian and Babu, 2020). In India, high diversity and endemism of odonates are found in southern Western Ghats, Eastern Himalayas, Western Himalayas and the Andaman and Nicobar Islands. Subramanian (2007) reported 176 species, including 68 endemics in Western Ghats. Subsequently, species diversity of odonates of Western Ghats has been updated to 196 (Subramanian and Babu, 2020). According to

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Emiliyamma (2014), southern Western Ghats have 169 species of odonates with 68 endemic species. Here, streams and rivers of Coorg, Wayanad, Nilgiris, Anamalais, Cardamom Hills and Agasthyamalais are rich in endemic species (Subramanian, 2007; Subramanian *et al*., 2011, Babu *et al.,* 2013; Kiran *et al.,* 2015; Emiliyamma and Palot, 2016 b; Subramanian *et al.,* 2018; Joshi and Sawant, 2019; Babu and Subramanian, 2019; Rangnekar *et al.,* 2019; Sadasivan *et al.,* 2021; Sadasivan and Palot, 2021; Bhakare *et al.,* 2021). The Western Ghats are known to host 74 endemic species including two, which are considered *species inquirenda* (Subramanian *et al.,* 2018), however, according to Kalkman *et al*. (2020) Western Ghats (WG) harbours 73 endemic species. The major compilations for Kerala state are the lists compiled by Radhakrishnan and Emiliyamma (2003) and later Emiliyamma *et al.* (2007), which included 137 species. Kiran and Raju (2013) enlisted 154 species of odonates for Kerala. As per Subramanian *et al.* (2020) the diversity of Odonata in the WG is represented by 203 species with 84 endemics. There are a few recent additions, range extensions and rediscoveries which have to be taken into account to generate the latest list of odonates of Kerala.

MATERIALS AND METHODS

This work is based on field data collected by the authors since 2010. Species photographs were taken with special emphasis on the structure of the prothorax and anal appendages. Taxonomy of the group follows Fraser (1933). The current checklist follows Subramanian and Babu (2017) and Paulson *et al*. (2021). The conservation status follows IUCN (2021) Red List assessment updated as on 03 June 2021. The current distribution of odonates of Western Ghats (WG) is based on Subramanian *et al.* (2018). The morphological descriptions follow Fraser (1933) and Garrison *et al.* (2006, 2010). All the recent additions and range extensions to the region are critically analyzed and added to the checklist. In addition to our personal records from field work since 2010, we reviewed all the peer reviewed published literature. In addition to the historical records of Fraser (1924a, 1924b, 1931, 1933, 1934, 1936), Rao and Lahiri (1982) and Mathavan and Miller (1989), unpublished personal field records of Kalesh Sadasivan (KS), Vinayan P Nair (VPN), Abraham Samuel (AS) and Md. Jafer Palot (MJP) from 2010 to 2020 were taken for the distribution data. Recent works referred were Radhakrishnan and Emiliyamma (2003), Subramanian (2007), Emiliyamma *et al.* (2007), Kiran and Raju (2013), Babu *et al.* (2013), Kiran *et al.* (2015), Emiliyamma and Palot (2016 b), Subramanian *et al.* (2018), Babu and Subramanian (2019), Joshi and Sawant (2019, 2020), Rangnekar *et al*. (2019), Joshi *et al*. (2020), Kalkman *et al.* (2020), Subramanian and Babu (2020), Sadasivan *et al.* (2021), Dawn (2021), Sadasivan and Palot (2021), Arunima and Nameer (2021) and Bose *et al.* (2021). A few spot records from other fellow naturalists and researchers were added as personal communication attributed to them, after verification by the authors. Data from non-peer reviewed publications and predatory journals were excluded. Regarding the distribution, a landscape based approach, modified from Sankar (2013), is taken here for WG part of Kerala (Table 1).

RESULTS

Kerala has a rich and diverse Odonata fauna with a total of 169 species as compiled from published records (Emiliyamma and Radhakrishnan, 2006; Sharma *et al.,* 2007; Kiran and Raju, 2013; Subramanian *et al.,* 2013; Varghese *et al*., 2014; Kiran *et al.,* 2015; Emiliyamma and Palot, 2016 a, b; Subramanian *et al.,* 2018; Thumboor and Jose, 2018; Rangnekar *et al.,* 2019; Emiliyamma *et al.,* 2020; Joshi *et al.,* 2020). To the 169 species compiled from the above publications, the authors have added the following eight species based on their personal records and publications. *Amphiallagma parvum* (Selys, 1876) in 2017, *Ceriagrion chromothorax* Joshi and Sawant, 2019 and *Platylestes platystylus* Rambur, 1842 in 2018 by VPN (all from Varadoor, Kannur district); *Pseudagrion australasiae* Selys, 1876 in 2019 by AS from Thumboormuzhi, Thrissur district; *Crocothemis erythraea* (Brullé, 1832) in 2019 from Munnar, *Protosticta rufostigma* Kimmins 1958 from Shendurney, Kollam and *Protosticta sholai*

Table 1. Summary of the Landscapes, Units, and subunits of Western Ghats in Kerala (modified from Sankar, 2013)

Landscape	Subunit with Location, average altitude above sea-level (ASL), land area in square kilometre and Rivers draining them	Protected Areas: Wildlife Sanctuaries (WLS)/ National Park (NP)/ Reserve forests (RF)/ Tiger Reserves (TR)	Borders
Agasthyamala	**Agasthyamalais** 8°15'16.37"N, 77°28'6.14"E to 9° 1'14.97"N, 77° 8'6.04"E 800 sq. km in Kerala ***Drainage*** Thamirabararni Neyyar Karamana Vamanapuram Ithikkara Kallada	Neyyar WLS, Peppara WLS, Trivandrum Forest Division, Kulathupuzha RF, Thenmala RF, and Shendurney WLS	Aralvaimozhi Pass to south of Ariyankavu Gap (Watershed area between Kallada and Achankovil on the Ambanad Hills). Kerala state, Trivandrum, Kollam to westand Tamil Nadu Plains Nagercoil, Kanyakumari, Tirunelveli to East. The Kalakkad Mundanthurai Tiger Reserve (KMTR) lies on the eastern slopes of this subunit.
Periyar	**Pandalam Hills** $9^0$5'N–$9^0$35'N $76^0$55'E–$77^0$17'E 1800 sq. km 500–1500 m ASL ***Drainage*** Achankovil Pamba	Achankovil RF, Punalur RF, Konni RF, Ranni RF, and Periyar TR (West Division)	Ariyankavu Gap to Ridge between Pamba and Periyar river watershed starting from Chokkampattymala. Tirunelveli and Rajapalayam, Tamil Nadu plains Ramanadapuram on east and Kollam, Pattanamthitta, Kottayam districts of Kerala on west.
	Cardamom Hills $9^0$15'N–$10^0$0'N to $76^0$45'E–$77^0$25'E 700–1000m ASL 2500 sq. km in Kerala High Wavys 1500 sq. km ***Drainage*** Periyar Manimala Meenachil	Periyar TR East, Peermedu Plateau, Vagamon, Idukki WLS, Mathikettan Shola NP (Lower/Western Slopes), and Munnar forest division (Kumili Range)	Ridge between Pamba and Periyar river watershed starting at Chokkampattymala in south to the Munnar Saddle (from Adimali–Panniyar–Deviyar–Chokkanadmala–Kolukkumala). Lower Periyar Subunit (Kottayam, Moovattupuzha) to west. Thirunelveli RF & Srivilliputhur sanctuary lies on its eastern slopes. Cumbum–Theni–Madura Plains to north and east. The Meghamalais, Varusanad hills and Andipatty hills are the north–eastern extension of the Periyar Hills of this subunit.
Munnar	**High Range Hills** $10^0$0'N –$10^0$15'N $76^0$55'E–$77^0$15'E 1800m ASL 1000 sq. km ***Drainage*** Periyar	Mankulam(High), Eravikulam NP, Munnar forest division (Devikulam Range), and Mathikettan Shola NP crest)	Munnar Saddle to Anamalai Ridge (Rajamala–Anamudi–Umayamala) Kolukkumala to Top station along Border to Bodinayakkanur RF on east and Lower Periyar Valleys on west.
	Anjanad Valley–Palni Hills $10^0$7'N – $10^0$23'N $77^0$5'E – $77^0$18'E Chinnar & Marayur and adjoining areas in Kerala (400 sq. km) Anjanad valley Amravati and Kukkal (700 sq. km) and	Marayur, Chinnar WLS, Anamudi Shola NP, Kurunjimala WLS, Pampadumshola NP, Palnis, and Amaravati Valley	Anamalais on west, Coimbatore plains, to the north. Madura plains to the east and High Range and Bodi Plains to the south. Palnis is the north–eastern extension of this subunit to its south.

Landscape	Subunit with Location, average altitude above sea-level (ASL), land area in square kilometre and Rivers draining them	Protected Areas: Wildlife Sanctuaries (WLS)/ National Park (NP)/ Reserve forests (RF)/ Tiger Reserves (TR)	Borders
	Palnis 1500 sq. km (both regions mainly falling in Tamil Nadu) ***Drainage*** Amaravati (Pambar and Chinnar)		
	Lower Periyar $10^0$0'N – $10^0$18'N $76^0$40'E – $77^0$0'E 1200 sq. km ***Drainage*** Periyar Edamalayar Pooyamkutty Moovattupuzha	Mankulam(Low), Munnar forest division (Neriyamangalam, Adimali), Malayattoor Division (Kuttampuzha, Edamalayar, Thundam), Kothamangalam Division (Mullaringad, Kothamangalam), and Thattaekkad Sanctuary	Anamalais and High Ranges on the north and northeast to Peermedu Plateau on south. Idukki Plateau of Cardamom Hills subunit on east and (Thattaekkad to Neriamangalam) Ernakulam and Kottayam districts on west,
	Nelliampathies – Anamalais $10^0$10'N – $10^0$35'N $76^0$22'E – $76^0$50'E 2500 sq. km in Kerala (1500 sq. km forest) 600 sq. km in Tamil Nadu ***Drainage*** Chalakudy river Bharathpuzha (GayathriPuzha) Aliyar Karuvannur (Chimmony) and Keecheri Rivers in Trissur	Nellimapathy, Parambikulam TR, Chalakudy, Athirapally–Vazhachal, Sholayar, Peechi–Vazhani WLS, Chimmony WLS, and Nenmara Division	Palghat Gap on the north to Valparai Spur separates it from Edamala Valley of Lower Periyar subunit on the south. Peechi–Vazhani hills extension into Thrissur district on west and extends in to the Anjnad valley on the Northeast, Pollachi and Coimbatore plains on the east.
Nilgiri	**Palghat hills** $10^0$48'N – $11^0$35'N $76^0$22'E – $76^0$50'E (Shiruvani–Palamalai range) ***Drainage*** Bhavani Walayar Malampuzha Noyil	Malamapuzha Hills, Chenat Nair RF Walayar RF Shiruvani RF Kanjirapuzha RF, Elival–Palamala and their northern slopes on Attapadi	Attapadi Valley in the North to Palghat Gap on south. Bolumpatty valley and Coimbatore plains on the east, Palghat district on the east. These extend as a ridge from the Shiruvani hills, through Walayar to reach Palamala through Elival Peak. The northern sides slope into the Attapadi valley and the southern part into the Palghat plains.
	Attapadi Plateau Attapadi plateau=1600 sq. km (500–600 sq. km forest) ***Drainage*** Bhavani	Attapadi Reserve	Attapadi Plateau to the southern slopes of Nilgiris.
	Silent Valley $10^0$48'N – $11^0$35'N $76^0$22'E – $76^0$50'E Nilambur slope=1500 sq. km (500–600 sq. km forest) Attapadi plateau except	Silent Valley, New Amarambalam, Nilambur slope, Attapady RF, and Mannarghat RF	Attapadi valley in the south to Nilambur valley–Gudalur. Palghat and Malappuram districts on the west and Coimbatore Plains and the Nilgiri plateau on east.

Landscape	Subunit with Location, average altitude above sea-level (ASL), land area in square kilometre and Rivers draining them	Protected Areas: Wildlife Sanctuaries (WLS)/ National Park (NP)/ Reserve forests (RF)/ Tiger Reserves (TR)	Borders
	Nilgiri slopes and Muthikulam = 350 sq. km Silent Valley Plateau 90 sq. km ***Drainage*** Kunthi Bhavani Chaliyar		
	Nilambur Slopes ***Drainage*** Karimpuzha Chaliyar	Karimpuzha WLS, and Nilambur Division	Western Slopes of Nilgiris.
Wayanad	**Wayanad** 2200 sq. km 900m ASL From North of Nilambur valley to Iritty Valley ***Drainage*** Kabani Kuttiady Korappuzha Mahe Thalasserry	Vellarimala, Periya RF, Lady Smith RF, Chembra, Wayanad WLS, Thirunelli RF, and Wayanad Forest Division (North & South)	Nilambur slope forests of Nilgiri Landscape from Gudalur gap to the Thirunelli Region of Brahmagiris and Coorg. Kozhikode and Kannur plains on west and Mudumalai, Bandipur, Nagarhole on east. The subunit extends as the Mysore Plateau eastwards.
Coorg	**Kannur Ghats** 1800 sq. km From Iritty Valley to Netravati Valley ***Drainage*** Anjarakandy Valapattanam Kuppam Kariangode Chandragiri Bavalipuzha	Kottiyoor WLS, Aaralam WLS, Kannur forest division, Kannavam RF, Vaythalmala, Brahmagiris, Thalacauvery, and Laterite Hillocks of Kannur and Kasaragod	Northern edge of Wayanad Plateau near Thirunelli to Netravati Valley in the north. Kannur and Kasaragod districts on the west and Thalacauvery and Brahmagiri WLS on the north and east.

Subramanian & Babu, 2020 in 2017 from PTR by KS; and *Zygonyx torridus isis* Fraser, 1924 by MJP from Aralam WLS, Kannur district has been added to Kerala list in the present publication elevating the total Odonata fauna of Kerala to 177 species. Another four species have been added, making the total number to 181, based on personal records of other workers, namely, *Paracercion malayanum* Selys, 1876 (Bo Nielson, per. com.) from Varkala, Thiruvananthapuram, *Indothemis limbata sita* Campion, 1923 (Muneer PK, per. com.) and *Indolestes pulcherrimus* Fraser, 1924 (Muneer PK, per. com.) from Wayanad and *Anax indicus* Leiftinck 1942 (Suhas RK, per. com.) from Chinnar. Recently Bhakare *et al.* (2021) described two new species of *Euphaea* from Maharashtra, northern Western Ghats and Koli *et al.* (2021) added a range extension of *Gynacantha khasiaca* MacLachlan, 1896 to WG. Thus, considering the above, the current checklist of Odonates of the WG stands at 207 species with 80 endemics and that of Kerala at 181 species with 68 endemics (Table 2). A detailed discussion on all taxa occurring in Kerala has been provided in the systematic part.

SYSTEMATIC ACCOUNT OF ODONATES OF KERALA

A total of 181 species of Odonates belonging to 87 genera under two suborders and 14 families were recorded from the geographical boundary of Kerala. The suborder Zygoptera comprises 74 species of damselflies (30 genera in seven families) and the suborder Anisoptera has 107 species (57 genera in seven families).

Suborder Anisoptera Selys, 1854

Superfamily Aeshnoidea Leach, 1815

Family Aeshnidae Leach, 1815

Aeshnidae in Kerala comprises nine species belonging to three genera, *Anaciaeschna* Selys, 1878 (2 species), *Anax* Leach, 1815 (5 species) and *Gynacantha* Rambur, 1842 (2 species). Among the 10 species of Aeshnidae found in the WG, except *Gynacantha rotundata* Navas, 1930 and *Gynacantha khasiaca* MacLachlan, 1896, all are found in Kerala. Subramanian and Babu (2017) considered *G. rotundata* as *species inquirenda.* There are no endemic species in WG and Kerala, belonging to the family Aeshnidae when taken *G. rotundata* as *species inquirenda.*

Genus *Anaciaeschna* Selys, 1878

Anaciaeschna is represented by two montane and crepuscular species in WG and Kerala. *Anaciaeschna jaspidea* (Burmeister, 1839) has been reported from Palghat hills (KS) and Nelliampathies–Anamalais landscapes (Gnanakumar *et al.,* 2012; KS). *Anaciaeschna martini* Selys, 1897 is found in Nelliampathies–Anamalais and Chinnar landscapes (Fraser, 1936). Coniff *et al.* (2019) synonymized *A. martini* with *A. donaldi* Fraser, 1922. Specific location of *A. martini* includes Palani hills, Anamalai hills and Nilgiris (Fraser, 1936). The species was rediscovered from Munnar and Pampadum Shola (Kalesh *et al.,* 2021). *Anaciaeschna jaspidea* was recorded from Kuzhalmannam, in Palakkad (KS), Chimmony WLS (Gnanakumar *et al.,* 2012) and at Athirappally and Peechi (KS). These are montane crepuscular species.

Genus *Anax* Leach, 1815

Anax is represented by five species both in WG and Kerala. *Anax ephippiger* (Burmeister, 1839) is rare in Kerala and is present in Coorg–Kannur landscape (KS), Palghat Hills (KS), Agasthyamalais (KS) and Coastal wetland landscapes (KS). It is said to be migratory (Fraser, 1936). *Anax guttatus* (Burmeister, 1839) is common throughout the plains of India and Fraser (1936) has an exceptional record of this insect at 6000 ft. from Anamalais. It has been reported from Coorg–Kannur landscape (Palot and Kiran, 2016; Nair, 2014), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Fraser 1936, KS), Chinnar (Adarsh *et al*., 2015), High Ranges (KS), Lower Periyar (AS; KS), Cardamom hills (Emiliyamma *et al*., 2007; KS), and Coastal wetlands landscape of Kuttanad (Raju, 2007), and Kattampally, Kannur (Roshnath, 2020). *Anax immaculifrons* (Rambur, 1842) is riverine in habitat and found in varying altitudes of 1500 – 7500 ft in montane areas (Fraser, 1936). It is found in Coorg–Kannur landscape (Palot and Kiran, 2016; Palot and Radhakrishnan, 2005; VPN), Wayanad (Palot and Emiliyamma, 2015; MJP), Nilgiri – Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2014; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015; KS), High Ranges (Sadasivan, 2018), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS) and Agasthya-malais landscape (KS). *Anax indicus* Leiftinck, 1942 (Fig. 1A), is found in Wayanad (KS), Nilgiri–Silent Valley (KS), Chinnar (Suhas R.K., per. com; Sadasivan, 2018), High Range (KS), Cardamom hills (AS; KS) and Agasthyamalai landscapes (KS). *Anax parthenope* (Selys, 1839) is a crepuscular migratory one usually found flying in company with *A. ephippiger* (Fraser, 1936). It is a rare odonate in Kerala and is reported from a coastal wetland landscape, Kumarakom of Alappuzha (KS; AS).

Genus *Gynacantha* Rambur, 1842

Gynacantha dravida Leiftinck, 1960 (Fig. 1D), is the commonest species of the genus in the state. This is a crepuscular mosquito hunter, and often

comes to light. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015; Sadasivan, 2018), High range (KS), Lower Periyar (Varghese *et al*., 2014; KS), Cardamom Hills (KS), Pandalam Hills (KS), Agasthyamalais (KS), and coastal wetlands landscape of Kadalundi and Ponnani, Malappuram (Emiliyamma, 2014), Kuttanad (Raju, 2007) and Kattampally, Kannur (Roshnath, 2020). *Gynacantha bayadera* Selys, 1891 is a crepuscular mosquito hunter in India. It also gets attracted to light. As per Kalkman *et al.* (2020) *G. millardi* Fraser, 1920 (Fig. 1C) is known from India and Sri Lanka. *Gynacantha bayadera* Selys, 1891 is found only in North East India. *Gynacantha millardi* has been reported from Coorg–Kannur landscape (Nair, 2014; Palot and Kiran, 2016), Wayanad (Palot and Emiliyamma, 2015), Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Adarsh *et al*., 2014; Gnanakumar *et al.,* 2012; KS), Chinnar (Adarsh *et al*., 2015; KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (KS), Agasthyamalais (KS) and coastal wetland landscape of Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020). *Gynacantha khasiaca* MacLachlan, 1896 has been added to WG fauna by Koli *et al.* (2021) but is not found in Kerala.

Superfamily Cordulegasteroidea Needham, 1903

Family Chlorogomphidae Needham, 1903

Genus *Chlorogomphus*

Chlorogomphidae of Kerala has single genus *Chlorogomphus* with two species. Among the three described Chlorogomphids in the WG, two endemic species are found in Kerala. *Chlorogomphus campioni* (Fraser, 1924) is found in Coorg–Kannur landscape (Fraser, 1931; Palot and Kiran, 2016), Wayanad (Fraser, 1931; Emiliyamma *et al*., 2007) and Nilgiri–Silent Valley (Fraser, 1931), whereas *C. xanthoptera* (Fraser, 1919) (Fig. 1B) was found to occur in Nelliampathies–Anamalais landscape (Fraser, 1931; KS), Chinnar (KS), High ranges (Fraser,1931; KS), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalai landscapes (KS). It is also considered as vulnerable as per IUCN Red List (Subramanian *et al.,* 2018). The third endemic species of WG, *C. brittoi* Navas, 1934, is considered *species inquirenda* (Subramanian and Babu, 2017) and later it was synonymized with *C. xanthoptera* (Kalkman *et al.,* 2020).

Superfamily Gomphoidea Rambur, 1842

Family Gomphidae Rambur, 1842

Gomphidae is the second family with highest species diversity in WG as well as in Kerala. All 17 genera found in WG are found in Kerala with 22 species in Kerala, out of 32 in WG.

Genus *Acrogomphus* Laidlaw, 1925

Genus *Acrogomphus* is represented by a single species, *A. fraseri* (Fig. 1F) which has been found in both WG as well as Kerala. *Acrogomphus fraseri* has been reported from Coorg–Kannur (Fraser, 1934), Nelliampathies–Anamalais (Fraser, 1934), High Ranges (Fraser, 1934), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalais landscapes (Toms Augustine per. com. AS; KS).

Genus *Asiagomphus* Asahina, 1985

Genus *Asiagomphus* has a single species *A. nilgiricus* (Laidlaw, 1922) (Fig. 1H) which has been found in High Range (KS), Cardamom hills (KS), Pandalam hills (KS) and Agasthyamalai landscapes (KS).

Genus *Burmagomphus* Williamson, 1907

Burmagomphus is represented by three species in WG and two in Kerala. *B. cauvericus* Fraser, 1926 has been reported in WG but not from Kerala. *B. laidlawi* Fraser, 1924 (Fig. 1G) has been reported from Wayanad (Fraser 1934), Nilgiri–Silent Valley (KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014; KS), Cardamom Hills (KS) and Agasthyamalai (KS) landscapes. *B. pyramidalis* Laidlaw, 1922 is found in Nilgiri–

Silent Valley (KS) and Agasthyamalai landscape (KS) only.

Genus *Cyclogomphus* Selys, 1854

Cyclogomphus is represented by two species in Kerala, out of four in WG. *Cyclogomphus heterostylus* Selys, 1854 was reported for the first time from Kerala as range extension by Emiliyamma and Radhakrishnan (2006) from Urukunnu at Thenmalai, Kollam district of Pandalam Hills landscape. Previously it has been reported from West Bengal, Maharashtra and Tamil Nadu. Later, it has been reported from Agasthyamalai landscape (Emiliyamma, 2014; KS). Rangnekar *et al*. (2019) described *C. flavoannulatus* (Fig. 2H) from Goa and Kerala. It is found in Nilgiri–Silent Valley landscape (Rangnekar *et al*., 2019), Lower Periyar (Rangnekar *et al*., 2019; KS), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalai landscapes (KS). Although the other two, *C. wilkinsi* Fraser, 1926 and *C. ypsilon* Selys, 1854 were reported from WG and no reports are there from Kerala. *Cyclogomphus wilkinsi* Fraser, 1926 and *C. ypsilon* previously thought to be endemic to WG was reported from West Bengal recently (Dawn, 2021).

Genus *Davidioides* Fraser, 1924

Davidioides is represented by a monotypic endemic species of WG, *D. martini* Fraser, 1924 and is found in Coorg–Kannur landscape (Fraser, 1934), Nilgiri–Silent Valley (Subramanian, 2007), Nelliampathies–Anamalais (KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS), and Pandalam Hills landscapes (KS).

Genus *Gomphidia* Selys, 1854

Gomphidia is represented by a single species in Kerala out of five in WG. Recently in the WG a new species *G. podhigai* Babu and Subramanian, 2019 described from Kanyakumari Wildlife Sanctuary has been identified as the fifth (Babu and Subramanian, 2019). *Gomphidia kodaguensis* Fraser, 1923 (Fig. 2F) is found in Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (Fraser, 1934; Palot and Emiliyamma, 2015; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (KS; Pradeepkumar *et al*., 2014), and Agasthyamalai landscapes (KS; AS).

Genus *Heliogomphus* Laidlaw, 1922

Both the species of *Heliogomphus* Laidlaw, 1922 found in WG are also found in Kerala. *Heliogomphus kalarensis* Fraser, 1934 is endemic to WG. *Heliogomphus promelas* (Selys, 1873) (Fig. 2C) is found in Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (MJP; Palot and Emiliyamma, 2015), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Fraser, 1934; Adarsh *et al*., 2014; KS), Lower Periyar (KS), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalai landscapes (KS; AS) where *H. kalarensis* Fraser, 1934 is found only at Nilgiri–Silent Valley landscape (KS). *Heliogomphus promelas* (Selys, 1873) is endemic to India and is considered near threatened (Subramanian *et al.,* 2018).

Genus *Ictinogomphus* Cowley, 1934

Ictinogomphus is represented by a single species *I. rapax* (Rambur, 1842) (Fig. 2E) in Kerala as well as in WG. It is present in Coorg–Kannur landscape (Emiliyamma *et al*., 2007; Nair, 2014; Palot and Kiran, 2016), Wayanad (Palot and Emiliyamma, 2015; MJP; Susanth and Anooj 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Sharma *et al*., 2007; Adarsh *et al*., 2015), High Range (KS), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamala landscape (KS) and Coastal wetland landscape of Kadalundi (Emiliyamma, 2014), Chempallikundu, Kannur (Palot and Soniya, 2004) and Kattampally (Roshnath, 2020).

Genus *Lamelligomphus* Fraser 1922

Lamelligomphus Fraser, 1922 is endemic to WG. *Lamelligomphus nilgiriensis* (Fraser, 1922) (Fig. 2B) is found in Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (Fraser, 1934),

Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Fraser, 1934) and Chinnar landscapes (Fraser, 1934). Two subspecies of *Lamelligomphus viz., L. nilgiriensis nilgiriensis* (Fraser, 1922) and *L. nilgiriensis annamallaicus* Fraser, 1934 are found in WG (Fraser, 1934).

Genus *Macrogomphus* Selys, 1857

Macrogomphus is represented by a single species *M. wynaadicus* Fraser, 1924 (Fig. 2A) in Kerala, out of the two in WG, the other being *M. annulatus* (Selys, 1854). *Macrogomphus wynaadicus* Fraser, 1924 is an endemic species of WG and is found in Coorg –Kannur landscape (KS), Wayanad (KS; Sushanth and Anooj, 2020; Fraser, 1934), Nilgiri–Silent Valley (KS), Palghat Hills (VPN; KS), Nelliampathies–Anamalais (KS), Lower Periyar (KS; AS), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalai landscapes in Kerala (KS).

Genus *Megalogomphus* Campion, 1923

Megalogomphus has two representative species in WG, *M. hannyngtoni* (Fraser, 1923) and *M. superbus* Fraser, 1931 and both are found in Kerala. *Megalogomphus hannyngtoni* (Fraser, 1923) is present in Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (Fraser 1934, Roshnath, per. com.), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (KS), Lower Periyar (Varghese *et al*., 2014), Pandalam Hills (KS) and Agasthyamalai landscapes (KS). *M. superbus* Fraser, 1931 is present in Nilgiri landscape only (Fraser, 1934). *Megalogomphus hannyngtoni* (Fraser, 1923) is endemic to India and is considered near threatened as per IUCN Red List (Subramanian *et al*., 2018). *Megalogomphus superbus* is a very rare odonate in Kerala, a WG endemic and not recorded after Fraser (1934).

Genus *Melligomphus* Chao, 1990

Melligomphus was originally described as *Onychogomphus,* however, Kalkman *et al.* (2020) separated it based on the shape of the anal appendages. *Melligomphus acinaces* Laidlaw, 1922 (Fig. 1E), is a WG endemic species. It is found in Coorg–Kannur (Vibhu V, per. com.), Wayanad (Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (KS), Chinnar (KS), Lower Periyar (KS), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalai landscapes (KS).

Genus *Merogomphus* Martin, 1904

Merogomphus has two endemic species in WG, *M. longistigma* (Fraser, 1922) and *M. tamaracherriensis* Fraser, 1931 (Fig. 2G) and both are found in Kerala. *Merogomphus longistigma* (Fraser, 1922) is a high altitude species present in the upper reaches of Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (Fraser, 1934, Manoj per. com.), Nelliampathies–Anamalais (KS), Chinnar (Fraser, 1934), Lower Periyar (KS), Cardamom Hills (KS) and Agasthyamalai landscapes (KS). *Merogomphus tamaracherriensis* Fraser, 1931, is found in low altitudes and is present in Coorg–Kannur landscape (VPN), Wayanad (Fraser, 1934), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (AS; KS), Pandalam Hills (KS) and Agasthyamalai landscapes (KS).

Genus *Microgomphus* Selys, 1858

Microgomphus is represented by three endemic species in WG of which only *M. souteri* Fraser, 1924 is present in Kerala. *Microgomphus souteri* (Fig. 2D) was first reported from Kerala at Aaralam WLS, Kannur by Emiliyamma *et al.* (2014). It is found in Coorg–Kannur (Nair, 2017; Emiliyamma *et al*. 2012, Palot and Kiran, 2016; VPN), Wayanad (VPN), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalai landscapes (KS). *Microgomphus verticalis* (Selys, 1873) of WG was considered as *species inquirenda* (Subramanian and Babu, 2017). However, Kalkman *et al.* (2020) considered it as valid and is a WG endemic species. *Microgompus torquatus* (Selys, 1854) is the third species endemic to WG yet to be reported from Kerala.

Genus *Nychogomphus* Carle, 1986

Nychogomphus is represented by a single species in WG and Kerala. *Nychogompus striatus* (Fraser,

1924) is a rare species present in Lower Periyar landscape (Varghese *et al*., 2014), Pandalam Hills (KS) and Agasthyamalais landscape (KS).

Genus *Onychogomphus* Selys, 1854

Onychogomphus malabarensis (Fraser, 1924) is a very rare odonate and has been reported only from Palakkad Hills landscape (Fraser, 1934). It is a WG endemic species. There are no records after Fraser (1934).

Genus *Paragomphus* Cowley, 1934

Paragomphus is represented by a single species *P. lineatus* (Selys, 1850) in both Western Ghats and Kerala and is found commonly in all landscapes including coastal wetlands. It has been reported from Coorg–Kannur (Palot and Kiran, 2016; Nair, 2017), Wayanad (Emiliyamma *et al*., 2007; MJP), Nilgiri–Silent Valley (KS), Palghat Hills (Fraser, 1934; KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015; Sadasivan, 2018; KS), High Ranges (Sadasivan, 2018; KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS) and Coastal wetland landscape of Kattampally (Roshnath, 2020).

Superfamily Libelluloidea Leach, 1815

Family Corduliidae Selys, 1850

Genus *Hemicordulia* Selys, 1870

Corduliidae in Kerala is represented by a single genus, *Hemicordulia* with a single species, *H. asiatica* (Selys, 1878). It is recorded from Coorg–Kannur landscape (Vibhu, V, per. com.), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Fraser, 1936;, KS), High Range (Fraser, 1931; KS), Lower Periyar (KS), Cardamom Hills (KS), Pandalam Hills (KS), Agasthyamalai landscapes (KS) and coastal wetlands of Kozhikode district (MJP).

Family Libellulidae Leach, 1815

Libellulidae has maximum species diversity in the WG as well as in Kerala. In WG, the family is represented by 31 genera with 54 species whereas in Kerala there are all 31 genera with 50 species. Adding a range extension of a species to both WG and Kerala in Libellulidae, *Crocothemis erythraea* (Brullé, 1832), and range extension to Kerala, *Zygonyx torridus isis* Fraser, 1924 raise the species diversity of Libellulidae to 55 in WG and 52 in Kerala.

Genus *Acisoma* Rambur, 1842

Acisoma is represented by only one species both in WG and Kerala, *A. panorpoides* Rambur, 1842 and is a widespread dragonfly present in Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016; Emiliyamma, 2014), Wayanad (Emiliyamma *et al*., 2007; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Sharma *et al*., 2007; Adarsh *et al*., 2015), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS; AS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscapes of Kadalundi (Emiliyamma, 2014), Ambalapuzha in Alleppy (AS), Chempallikkundu, Kannur (Palot and Soniya 2004), Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020).

Genus *Aethriamanta* Kirby, 1889

Aethriamanta has a single species both in WG and Kerala. *Aethrimanta brevipennis* (Rambur, 1842) is present in Coorg–Kannur landscape (VPN; Palot and Radhakrishnan, 2005, Emiliyamma, 2014; Palot and Kiran, 2016), Wayanad (Susanth and Anooj, 2020), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015; Sadasivan, 2018; KS), High Ranges (Sadasivan, 2018; KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscape of Kadalundi,

(Emiliyamma, 2014), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and Kumarakom (Manoj P, per. com.).

Genus *Brachydiplax* Brauer, 1868

Brachydiplax is represented by two species both in WG and Kerala and *Brachydiplax chalybea* Brauer, 1868 is found in Coorg–Kannur landscape (Nair, 2014), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015), Lower Periyar (Varghese *et al*., 2014; Emiliyamma, 2005; AS), Cardamom Hills (KS), Pandalam Hills (KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and Coastal wetland landscape of Kadalundi (Emiliyamma, 2014), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and Kumarakom (Manoj P, per. com.). *B. sobrina* (Rambur, 1842) is found in Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015), Lower Periyar (Emiliyamma *et al*., 2007; Varghese *et al*., 2014; AS), Pandalam Hills (KS), Agasthyamalais (KS) and Coastal wetland landscape of Kumarakom, Chempallikkundu (Emiliyamma, 2014), Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020).

Genus *Brachythemis* Brauer, 1868

Brachythemis has a single species both in WG and Kerala and *B. contaminata* (Fabricius, 1793) is found in Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Emiliyamma, 2014; Palot and Emiliyamma, 2015; MJP), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007), Palghat plains (Palot *et al.,* 2006), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan 2014, Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Sharma *et al*., 2007; Adarsh *et al*., 2015), High ranges (Sadasivan, 2018; KS), Lower Periyar (Varghese *et al*., 2014; Emiliyamma, 2005; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalai landscape (Emiliyamma and Radhakrishnan, 2002; KS), and coastal wetlands landscape of Mannar, Alleppy (Emiliyamma, 2014), Chempallikundu (Palot and Soniya, 2004), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020), mangroves of north Kerala (Radhakrishnan *et al*., 2006). This species is commonly found in most of the wetlands including polluted waters all over Kerala.

Genus *Bradinopyga* Kirby, 1893

Bradinopyga is represented by two species in WG, *B. geminata* (Rambur, 1842) and *B. konkanensis* Joshi & Sawant, 2020. *Bradinopyga konkanensis* is a recent addition to WG Odonata fauna from Maharashtra (Joshi and Sawant, 2020), there are no confirmed records of the species from Kerala. Having examined numerous *Bradinopyga* specimens from Kannur and Kasaragod in North Kerala, the recent record from Kasaragod district, Kerala (Haneef *et al.,* 2021), needs further confirmation with detailed examination of male secondary genitalia. *Bradinopyga konkanensis* is endemic to WG. *Bradinopyga geminata* (Rambur, 1842) is a common species and is found in Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Palot and Emiliyamma, 2015; MJP), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015, Sadasivan, 2018; KS), High ranges (Sadasivan, 2018; KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan 2002; KS) and coastal wetlands landscape of Kadalundi (Emiliyamma, 2014), Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020).

Genus *Cratilla* Kirby, 1900

Cratilla Kirby, 1900 is also represented by a single species in WG and Kerala and the only species *C. lineata calverti* (Forster, 1903) (Fig. 4C) is found in Coorg–Kannur landscape (Nair, 2014; Emiliyamma, 2014; Palot and Kiran, 2016; VPN),

Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; KS), Chinnar (KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS) and Agasthyamalais landscape (KS).

Genus *Crocothemis* Brauer, 1868

Crocothemis Brauer, 1868 is represented by *C. servilia* (Drury, 1770) in both Western Ghats and Kerala so far and a range extension of *C. erythraea* (Brullé, 1832) to Western Ghats and Kerala is added now. *Crocothemis erythraea* (Brullé, 1832) (Fig. 3A) is an ice age relict present only at high altitudes in High Ranges (KS; Sadasivan, 2018) and Cardamom Hills landscape (Sadasivan, 2018; KS). *Crocothemis servilia* (Drury, 1770) is a widespread dragonfly in paddy fields and open lands of Kerala and is found in Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri – Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS; Emiliyamma, 2014), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; KS), Chinnar (KS; Sharma *et al*., 2007; Sadasivan, 2018), High Range (Sadasivan, 2018), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS; Peters,1981; Emiliyamma and Radhakrishnan, 2002) and Coastal wetlands landscape of Kadalundi (Emiliyamma, 2014), Chempallikundu (Palot and Soniya, 2004), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006).

Genus *Diplacodes* Kirby, 1889

Diplacodes is represented by three species in WG and Kerala. *Diplacodes trivialis* (Rambur, 1842) is very common in Coorg – Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Emiliyamma, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007), Palghat Hills (Emiliyamma *et al*., 2007; Emiliyamma, 2014; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015; Sharma *et al*., 2007; Sadasivan, 2018), High Ranges (Sadasivan, 2018), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS; Emiliyamma, 2014), Pandalam Hills (Pradeepkumar *et al*., 2014; KS; Emiliyamma, 2014), Agasthyamalais (KS; Peters, 1981; Emiliyamma and Radhakrishnan, 2002) and Coastal wetlands landscape of Kadalundi, Ponnani (Emiliyamma, 2014), Chempallikkundu (Palot and Soniya 2004), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and Mangroves of North Kerala (Radhakrishnan *et al*., 2006). *Diplacodes nebulosa* (Fabricius, 1793) is an uncommon species present in Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; MJP), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015), High Ranges (Sadasivan, 2018; KS), Lower Periyar (KS; Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS) and coastal wetlands landscape (Raju, 2007; Emiliyamma, 2014; Roshnath, 2020). *Diplacodes lefebvrii* (Rambur, 1842) is a very rare species in WG and Kerala and is found only in Coorg–Kannur landscape of north Kerala (VPN; MJP).

Genus *Epithemis* Laidlaw, 1955

Epithemis is represented by a single species both in WG and Kerala. *Epithemis mariae* (Laidlaw, 1915), one of the monotypic endemic odonates (Fig. 3H), is a typical forest species present in Coorg–Kannur landscape (Emiliyamma, 2014; Palot and Kiran, 2016; VPN), Wayanad (Emiliyamma *et al*., 2007; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; KS; MJP),

Lower Periyar (Varghese *et al*., 2014; KS; AS; MJP), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (KS) and Agasthyamalais landscape (KS; MJP). It is usually found near water in thick forests and breeds in marshy areas at the foot hills (Emiliyamma *et al*., 2007). Das *et al.* (2013) reported that this species is exclusively found in lowland forest swamps of southern WG.

Genus *Hydrobasileus* Kirby, 1889

Hydrobasileus is represented by a single species *H. croceus* (Brauer, 1867) in WG and Kerala. It is present in Coorg–Kannur landscape (Nair, 2014; Palot and Kiran, 2016; VPN), Wayanad (VPN), Nilgiri-–Silent Valley (KS; VPN), Palghat Hills (Fraser, 1936; KS), Nelliampathies–Anamalais (Adarsh *et al*., 2014; KS), Lower Periyar (AS; Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; Emiliyamma, 2014; KS), Agasthyamalais (KS) and coastal wetland landscape of Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020).

Genus *Hylaeothemis* Ris, 1909

Hylaeothemis is represented by single species in both WG and Kerala. Kalkaman *et al.* (2020) synonymized *H. apicalis* Fraser, 1924 with *H. indica* Fraser, 1946. *Hylaeothemis apicalis* (Fig. 4E) is present in Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalais landscape (KS). It is seen in large colonies with short and weak flights looking like gomphids and is usually found settled on plants in high altitudes. It breeds in marshy areas along the banks of mountain streams at about 2000 ft. or above altitude (Emiliyamma *et al*., 2007). Das *et al.* (2013) reported that this species is an inhabitant of lowland forest swamps of southern WG.

Genus *Indothemis* Ris, 1909

Indothemis is represented by two species, *I. carnatica* (Fabricius, 1798) and *I. limbata sita* Campion, 1923 (Fig. 3B), both in WG and Kerala. *Indothemis carnatica* (Fig. 3D) is found in Coorg–Kannur landscape (VPN; KS), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007), Palghat Hills (KS), Nelliampathies–Anamalais (Adarsh *et al*., 2014; KS), Lower Periyar (KS), Cardamom Hills (AS; KS), Pandalam Hills (KS) and Agasthyamalai landscapes (KS). It is considered near threatened species as per the IUCN Red List (Subramanian *et al*., 2007; Subramanian *et al.,* 2020). However, as per the IUCN (2021) Red List, it is considered least concern species. *Indothemis limbata sita* has been reported from Wayanad landscape in June 2020 (Muneer PK, per. com.).

Genus *Lathrecista* Kirby, 1889

Lathrecista is represented by *L. asiatica* (Fabricius, 1798) both in WG and Kerala and is a very common species found in Coorg–Kannur landscape (Nair, 2014; Palot and Kiran, 2016; VPN), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015), Lower Periyar (Emiliyamma *et al*., 2007; Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalai landscape (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscape of Kadalundi (Emiliyamma, 2014), Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020).

Genus *Lyriothemis* Brauer, 1868

The genus is represented by two species both in WG and Kerala. *Lyriothemis acigastra* (Selys, 1878) (Fig. 3E) is found in Coorg–Kannur landscape (VPN; KS; Emiliyamma *et al.,* 2013), Nelliampathies–Anamalais (KS), Lower Periyar (KS), Cardamom hills landscape (Jebin J, per. com.) and Kattampally of coastal wetland landscape (Roshnath, 2020). *Lyriothemis acigastra* (Selys, 1878) was first reported in Kerala from a sacred grove, Aravanchal Kavu and a table top laterite hillock, Madayipara of Kannur district, North Kerala (Emiliyamma *et al.*, 2013). The second species *L. tricolor* Ris, 1919 (Fig. 3F) is the only species

using phytotelmata as a breeding habitat in India. It is generally found associated with Myristica swamps. Larval habitat, breeding behavior and range extension to southern WG have been reported at Silent Valley NP, New Amarambalam RF and Salim Ali Bird Sanctuary, Thattaekkad in Kerala (Das *et al.,* 2013). It has also been reported from Aaralam Wildlife Sanctuary (Palot and Kiran, 2016) and Shendurney WLS (KS). As a whole in Kerala it is reported from Coorg–Kannur (Palot and Kiran, 2016), Wayanad (KS), Nilgiri–Silent Valley (Das *et al.,* 2013; KS), Lower Periyar (Das *et al.,* 2013) and Agasthyamalai landscapes (KS).

Genus *Macrodiplax* Brauer, 1868

Macrodiplax Brauer, 1868, is represented only by a single species in WG and Kerala, *M. cora* (Brauer, 1867) and is one of the most dominant dragonflies of the world and the wide distribution is due to its annual migration taking place in October (Fraser, 1936). It is mainly restricted to coastal areas in Kerala; however, Fraser has recorded *M. cora* 50 miles (80.5 km) away from sea in WG which may be due to migration. It commonly breeds in marshes and may be found breeding in brackish water near estuaries. It resembles *P. flavescens* in appearance but is smaller and has conspicuous black mid-dorsal markings over the abdomen. It has been reported from coastal wetland landscapes. Palot and Soniya (2004) reported it from Chempallikkundu coastal wetlands, Alappuzha (KS); Radhakrishnan *et al*. (2006) from mangrove wetlands of Kannur and Roshnath (2020) reported it from Kattampally wetlands.

Genus *Neurothemis* Brauer, 1867

Neurothemis is represented by three species both in WG and Kerala. *Neurothemis fulvia* (Drury, 1773) is a common insect in wet and semi-wet areas and it occurs in large colonies at the borders of jungles and in low lying swampy country (Fraser, 1936). It generally breeds in weedy ponds but prefers marshes mostly. The clear uncolored wing tips will help to distinguish *N. fulvia* males from other *Neurothemis* and females by the uniform golden-amber tint of the ground color of the wings, with or without clear apex in forewing (Fraser, 1936). It is reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Wayanad (Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS) and coastal wetland landscapes of Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020). *Neurothemis intermedia intermedia* (Rambur, 1842) is common in paddy fields of Kerala. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Nilgiri–Silent Valley (KS), Palghat hills (Emiliyamma *et al*., 2007; Emiliyamma, 2014; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; KS), Lower Periyar (KS), Pandalam Hills (KS), Agasthyamalais (KS) and coastal wetland landscapes of Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020). *Neurothemis tullia* (Drury, 1773) is a very common insect with black base of wing with opalescent white outer bordering in males and females having apices of the wings with broad black and sickle shaped stripe on basal half (Fraser, 1936). It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015, Sharma *et al*., 2007), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS; Emiliyamma, 2014), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Peters 1981; Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetlands landscape of Chempallikundu (Palot and Soniya, 2004), Kuttanad (Raju, 2007), Kattampally

(Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006).

Genus *Onychothemis* Brauer, 1868

Onycothemis Brauer, 1868 is represented in WG and Kerala by a single species. *Onychothemis testacea ceylanica* Ris, 1912 (Fig. 4B) is large size robust build dragonfly with dark metallic coloring with bright yellow markings and the claws are devoid of usual hooks (Fraser, 1936). It is a bold and strong flier with short flight and mainly found in submontane areas. It has been reported from Coorg–Kannur landscape (Nair, 2017; Palot and Kiran, 2016), Wayanad (VPN;MJP), Nilgiri–Silent Valley (KS; VPN), Nelliampathies–Anamalais (KS), Lower Periyar (Varghese *et al*., 2014; AS; KS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS) and coastal wetland landscape of Kattampally, Kannur (Roshnath, 2020).

Genus *Orthetrum* Newman, 1893

Orthetrum is represented by seven species in Kerala out of eight in WG. Except *O. coerulescens anceps* (Schneider, 1845), all other *Orthetrum* of WG are present here. *Orthetrum chrysis* (Selys, 1891) is a common dragonfly frequenting small brooks and submontane streams and breeds in pools and marshes near such habitats (Fraser, 1936). It has been recorded from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Emiliyamma and Radhakrishnan 2014; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015; KS; Sadasivan, 2018), High ranges (Sadasivan, 2018; KS), Lower Periyar (Varghese *et al*., 2014; Emiliyamma, 2005; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscapes of Kadalundi (Emiliyamma, 2014), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and Mangroves of North Kerala (Radhakrishnan *et al*., 2006). *Orthetrum glaucum* (Brauer, 1865) is a common species found throughout the plains and up to 1200 m altitude. It may vary greatly in color with age and vary in size with altitude. It has a small dark amber spot at the base of the wing and a narrow abdomen with a black tip (Fraser, 1936). It has been reported from Coorg – Kannur landscape (Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Emiliyamma and Radhakrishnan, 2014; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015; KS), High ranges (Sadasivan, 2018; KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS) and coastal wetland landscape of Kattampally (Roshnath, 2020). *Orthetrum luzonicum* (Brauer, 1868) is also a very common species in plains and forests at low altitude. The transparent wing base and bluish green eyes help to distinguish it from related species. It has been reported from Coorg–Kannur landscape (Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri – Silent Valley (KS), Palghat Hills (KS), Nelliampathies – Anamalais (Gnanakumar *et al.,* 2012; Emiliyamma and Radhakrishnan, 2014; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015), High ranges (Sadasivan, 2018), Lower Periyar (Varghese *et al*., 2014; Emiliyamma, 2005; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; Emiliyamma, 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscapes of Kattampally (Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006). *Orthetrum pruinosum neglectum* (Rambur, 1842) is a widespread dragonfly in the plains found everywhere and rarely found at high altitudes. It breeds in small tanks and pools in river beds and the adult male can be distinguished by its unique violet colored abdomen (Fraser, 1936). It is usually found in company with its congener *O. chrysis.* It

has been recorded throughout the state from Coorg–Kannur landscape (Nair, 2014; Emiliyamma 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Sharma *et al*., 2007; Adarsh *et al*., 2015, Sadasivan, 2018), High range (KS; Sadasivan, 2018), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscape of Kattampally (Roshnath, 2020), Kadalundi (Emiliyamma, 2014) and mangroves of north Kerala (Radhakrishnan *et al*., 2006). *Orthetrum sabina sabina* (Drury, 1770) is the most predaceous of all dragonflies and even feeds on some species showing cannibalism (Fraser, 1936). In flight it may be confused with gomphids due to markings on abdomen but can be distinguished by extraordinary shape of the abdomen. It is widespread everywhere even at high altitudes. It has been reported from Coorg–Kannur landscape (Nair, 2014; Palot and Radhakrishnan, 2015; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Sharma *et al*., 2007; Adarsh *et al*., 2015; KS; Sadasivan, 2018), High Ranges (Sadasivan, 2018; KS), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Peters 1981; Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscapes of Kadalundi (Emiliyamma, 2014), Chempallikkundu (Palot and Soniya, 2004), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006). *Orthetrum taeniolatum* (Schneider, 1845) is an uncommon species in the dry areas of Kerala and is found especially in north Kerala. It is found in river beds perched on rocks or the sandy foreshores camouflaged with the background (Fraser, 1936). Small size and greyish dorsum of the thorax help to distinguish it from the congeners. It has been reported from Coorg–Kannur landscape (Emiliyamma *et al*., 2007; Palot and Kiran, 2016), Nelliampathies–Anamalais (KS), Chinnar (Sadasivan, 2018), and Agasthyamalais landscape (KS). *Orthetrum triangulare triangulare* (Selys, 1878) (Fig. 4A) is a high altitude species both in WG and Kerala. It has been reported in the high altitudes of Coorg–Kannur landscape (KS), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (KS), Chinnar (KS; Sadasivan, 2018; Sharma *et al*., 2007), High Ranges (Sadasivan, 2018; KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalais landscape (KS).

Genus *Pantala* Hagen, 1861

These are rather large sized robust built ochreous or reddish colored dragonflies with uncolored wings. *Pantala* is represented by a single species *Pantala flavescens* (Fabricius, 1798) in WG and Kerala. According to Anderson (2009), *P. flavescens* (Fig. 4H) shows massive movement as a part of their annual migration across the western Indian Ocean from India to East Africa. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Sharma *et al*., 2007Adarsh *et al*., 2015, Sadasivan, 2018), High Range (Sadasivan, 2018; KS), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma, 2014; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Peters 1981; Emiliyamma and Radhakrishnan, 2002; KS) and

coastal Wetlands landscape of Kadalundi (Emiliyamma, 2014), Chempallikundu (Palot and Soniya, 2004), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006).

Genus *Paplopleura* Rambur, 1842

Paplopleura is represented by a single species in WG and Kerala. *Paplopleura sexmaculata* (Fabricius, 1787) is a small but robust dragonfly which occurs in large colonies in marshy spots. They usually breed in bamboo jungles and are the smallest dragonfly in Kerala and WG (Fraser, 1936). They mimic hymenopteran insects in appearance and flight. It has been reported from Coorg–Kannur landscape (Emiliyamma 2014; Palot and Radhakrishnan 2015; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; KS), Chinnar (Sharma *et al*., 2007), Lower Periyar (KS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (KS; Emiliyamma, 2014) and Agasthyamalais landscapes (KS).

Genus *Potamarcha* Karsch, 1890

Potamarcha Karsch is represented by a single species both in WG and Kerala. *Potamarcha congener* (Rambur, 1842) is very similar to *Cratilla* with moderate size but never metallic, blackish brown colored marked with yellow but the markings are partly or entirely covered by an overlay of bluish pruinescence (Fraser, 1936). Abdomen varies greatly in color according to age. It is a common insect fond of dry areas and breeds in small weedy ponds and marshes. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Sadasivan, 2018), High Ranges (Sadasivan, 2018; KS), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetlands landscape of Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020).

Genus *Rhodothemis* Ris, 1909

Rhodothemis is also represented by a single species both in WG and Kerala. The representative member *R. rufa* (Rambur, 1842) is characterized by its large size, homogenous scarlet–red appearance which resembles *Crocothemis servilia*, *Crocothemis erythraea*, *Urothemis signata* and *Orthetrum chrysis*. The very short contiguity of the eyes, the discoidal field beginning with a row of three cells and continuing with a row of two cells, for a distance of 5–7, cells, and the characteristic armature of legs help to distinguish it from other species mentioned above. The female has a citron yellow continuous line from occiput to well on to the abdomen. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005, Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Wayanad (Palot and Emiliyamma, 2015; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Emiliyamma and Radhakrishnan 2014; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscape of Kadalundi (Emiliyamma, 2014), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006).

Genus *Rhyothemis* Hagen, 1867

Rhyothemis is represented by two species in WG and Kerala. *Rhyothemis triangularis* Kirby, 1889 (Fig. 3G) is an uncommon dragonfly with an opaque black area limited to the base of the wings. It has been reported from Coorg–Kannur landscape (Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Susanth and Anooj,

2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007), Nelliampathies–Anamalais (KS), Lower Periyar (KS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS) and Agasthyamalais landscapes (KS). *Rhyothemis variegata variegata* (Linnaeus, 1763) is gregarious and usually occurs in large colonies over marshy spots or large weedy tanks. With a weak flight they fly low and wing action is fluttering like that of larger Lepidoptera (Fraser, 1936). It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015), High Range (KS), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS; Jebin. J, per. com.), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS), coastal wetland landscape of Mannar, Kumarakom (Emiliyamma, 2014), Chempallikundu (Palot and Soniya, 2004), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006).

Genus *Sympetrum* Newman, 1833

Sympetrum is represented by two species in WG – *S. fonscolombii* (Selys, 1840) (Fig. 3C) and *S. hypomelas* (Selys, 1884) of which only *S. fonscolombii* is known from Kerala. It is a montane species common above 1800 m in Kerala, known only from higher reaches of Chinnar (Sadasivan, 2018; KS), Anamudi Shola NP, Eravikulam NP (MJP), High Ranges (Sadasivan, 2018; KS), Cardamom Hills (KS; AS; Manoj P, per. com.) and Agasthyamalais landscapes (KS).

Genus *Tetrathemis* Brauer, 1868

Tetrathemis platyptera Selys, 1878 (Fig. 4D) is a small dragonfly with abdomen shorter than wings, found throughout the submontane wet areas (Fraser, 1936). The adults usually lay eggs on objects overhanging water and the newly hatched larvae drop into their future habitat. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Palot and Kiran, 2016), Wayanad (VPN; Palot and Emiliyamma, 2015; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (VPN; KS) and coastal wetland landscape of Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020).

Genus *Tholymis* Hagen, 1867

Tholymis is represented by a single species *T. tillarga* (Fabricius, 1798) both in WG and Kerala and is a crepuscular insect which rests under heavy shade in scrub or bamboo jungle during the day and breeds in marshes and weedy tanks (Fraser, 1936). It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Sharma *et al*., 2007; Adarsh *et al*., 2015), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS), coastal wetland landscape of Chempallikundu (Palot and Soniya, 2004), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006).

Genus *Tramea* Hagen, 1861

Tramea is represented by three species *T. basilaris* (Palisot de Beauvois, 1805), *T. limbata* (Desjardins, 1832), and *T. virginia* (Rambur, 1842) in WG as

well as in Kerala. *Tramea basilaris* is a common insect throughout the plains and may be rarely seen in high altitudes. It may accompany *Pantala* during migration for a shorter distance (Fraser 1936). It has been reported from Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (VPN), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; KS), Chinnar (KS), Lower Periyar (KS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS), and Kattampally of Coastal wetland landscape (Roshnath, 2020). *Tramea limbata* has a very dark, sharply defined basal marking in the hind wing, not surrounded by a golden-yellow areola for distinguishing it from other *Tramea* sp. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2014; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015), Lower Periyar (Varghese *et al*., 2014; Emiliyamma, 2005; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Peters, 1981; Emiliyamma and Radhakrishnan, 2002; KS), coastal wetlands landscape of Kadalundi, Kolavipalam (Emiliyamma, 2014), Chempallikundu (Palot and Soniya, 2004), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006). *Tramea virginia* (Rambur, 1842) has been reported only from Chinnar of Anjanad valley landscape (Sharma *et al*., 2007).

Genus *Trithemis* Brauer, 1868

Trithemis is represented by four species both in WG and Kerala. *Trithemis aurora* (Burmeister, 1839) is a very common dragonfly in forests and country side. The almost general violaceous coloration of males helps to distinguish their males from other congeners. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015, Sadasivan, 2018; KS; Sharma *et al*., 2007), High Range (Sadasivan, 2018; KS), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma, 2014; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscape of Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020). *Trithemis festiva* (Rambur, 1842) has been reported from Coorg–Kannur landscape (Palot and Kiran, 2016; Nair, 2017), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (KS; Emiliyamma *et al*., 2007), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; KS), Chinnar (Sharma *et al*., 2007; Sadasivan, 2018), High Ranges (Sadasivan, 2018; KS), Lower Periyar (Varghese *et al*., 2014; Emiliyamma, 2005; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS). *Trithemis kirbyi* Selys, 1891, is reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Emiliyamma, 2014; Palot and Kiran, 2016), Palghat Hills (Emiliyamma *et al*., 2007), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Emiliyamma *et al*., 2007; KS), Chinnar (Emiliyamma *et al*., 2007; KS), High Ranges (KS), Lower Periyar (KS), Cardamom Hills (Emiliyamma *et al*., 2007; KS) and Agasthyamalais landscape(KS). *Trithemis pallidinervis* (Kirby, 1889) is a common insect throughout the state, the largest among the genus, and it breeds only in stagnant waters of marshy areas. The adult is usually found perched on top of reeds along with fellow members, all facing the wind, elevating itself by its long spidery legs bunched together like a stalk (Fraser, 1936). Sexes

are alike. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016),Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al*., 2015; Sharma *et al*., 2007), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS), coastal wetland landscape of Kadalundi (Emiliyamma, 2014), Chempallikundu (Palot and Soniya, 2004), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006).

Genus *Urothemis* Brauer, 1868

Urothemis signata (Rambur, 1842) (Fig. 4G) is a moderately large sized red dragonfly with large eyes and broad dark amber colored spots at the base of the hindwing. It is common around marshes, streams, and lakes. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Susanth and Anooj, 2020), Palghat Hills (KS), Nelliampathies–Anamalais (KS), Lower Periyar (Varghese *et al*., 2014; Emiliyamma, 2005; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (KS), Agasthyamalais (KS), coastal Wetland landscape of Kadalundi, Kumarakom (Emiliyamma, 2014), Kuttanad (Raju, 2007), Kattampally (Roshnath, 2020) and mangroves of north Kerala (Radhakrishnan *et al*., 2006).

Genus *Zygonyx* Hagen, 1867

Zygonyx is represented by two species – *Z. iris malabarica* Fraser, 1926 and *Z. torridus isis* Fraser, 1924 in WG and Kerala. *Zygonyx iris malabarica* Fraser, 1926, looks like Corduliidae in general appearance and breeds in swift montane streams (Fraser, 1936). It has been reported from Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; KS), Lower Periyar (Varghese *et al.,* 2014), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), and Agasthyamalais landscapes (KS). *Zygonyx torridus isis* has been reported from Meenmutti Falls area of Aaralam WLS, of Coorg–Kannur landscape in August, 2017 (MJP).

Genus *Zyxomma* Rambur, 1842

Zyxomma petiolatum Rambur, 1842 (Fig. 4F) is a moderate sized slender crepuscular dragonfly (Fraser, 1936). It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016;), Wayanad (Emiliyamma *et al*., 2007; Palot & Emiliyamma, 2015), Nilgiri–Silent Valley (KS), Palghat hills (KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Chinnar (Adarsh *et al.,* 2015; KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS; VPN), and coastal wetlands landscape of Kadalundi (Emiliyamma, 2014), Kuttanad (Raju, 2007) and Kattampally (Roshnath, 2020).

Family Macromiidae Needham, 1903

Large odonates, with swift flight, usually restricted to fast flowing streams of WG and the foot hills. Two genera are found in the region–*Epophthalmia* Burmeister, 1839 and *Macromia* Rambur, 1842. The adult of the former has the cells of the forewings traversed.

Genus *Epophthalmia* Burmeister, 1839

Epophthalmia Burmeister, 1839 is diagnosed from the related genus *Macromia* Rambur, 1842 by the cell in forewing and hindwing in *Macromia* being entire and not traversed by veins, while in *Epophthalmia* the cells in forewing are always traversed. *Epophthalmia vittata vittata* Burmeister, 1839 is a common lowland species of open areas and in general appearance resembles a

well-marked *Macromia flavicincta*. Recently recorded from Varadoor, Kannur (Nair, 2017) Trichambaram, Kannur (VPN), Wayanad (KS), Walayar (Emiliyamma *et al*., 2007), Thrissur (Adarsh *et al*., 2014), Chimmony, Athirapally, Peechi (KS), Meenachil, Kottayam (AS), Thattaekkad (KS), Periyar Tiger Reserve (KS), Achankovil (KS), Trivandrum City and Attingal (KS), Shendurney (KS), Peppara (KS), Neyyar (KS). *Epophthalmia frontalis binocellata* Fraser, 1936, is a rare forest insect distinguished from the previous species by the dark coloration resembling *Macromia ellisoni* and the paired dorsal spots S4–6 instead of annules. The regional records of occurrence are from Aaralam of Coorg–Kannur (MJP), Thamaracherry of Wayanad (Fraser, 1936), Walayar of Palghat Hills (Fraser, 1936), Chimmony and Peechi of Nelliampathies–Anamalais (KS), Thattaekkad, Pooyamkutty of Lower Periyar (KS), Achankovil of Pandalam Hills (KS) and Shendurney WLS of Agasthyamalai landscape (KS).

Genus *Macromia* Rambur, 1842

Macromia is represented by nine species both in Kerala and in WG and are generally rare insects. *Macromia annaimallaiensis* Fraser, 1931 was reported from Anamalai landscape Kallar and Shaliyar (Chaliyar?) rivers in Kerala (Fraser, 1936) and is confined to hills south of Palghat Gap (Fraser, 1936). There are no recent confirmed records of the species. We are including this species based on a sighting at Ponmudi Dam, Munnar (KS). *Macromia bellicosa* Fraser, 1924 (Fig. 6D), was observed at Kannur Ghats, Aaralam, and Thirunelli in Wayanad (KS). Varghese *et al*., 2014, recorded it from Lower Periyar Valley. *Macromia cingulata* Rambur, 1842 (Fig. 6B), is reported from Munnar, Palghat Plains (KS) and Nilambur (Divin Murukesh M, per. com.). *Macromia ellisoni* Fraser, 1924 (Fig. 6A) is not an uncommon species in the Anamalais and Agasthyamalais. The recent records are Pandipathu in Agasthyamalais and Pampadum Shola National Park (KS), Konni Forest Division (Pradeepkumar *et al*., 2014), and Aaralam, Kannur (Palot and Kiran, 2016). *Macromia flavocolorata* Fraser, 1922 (Fig. 6E) is not uncommon in the low to mid-elevations of the state in all landscapes. The historical records are from Cannannore Ghat, Kerala (Fraser 1924) and Anamalai (Fraser, 1936). The recent records are from Thenmalai (KS), Thirunelli in Wayanad (KS), and Mukkali, Silent Valley NP (Biju PB, per. com.). *Macromia ida* Fraser, 1924, is reported from Gudalur, Wayanad–Nilgiris (Malappuram border) (Fraser, 1924), WG both north and south of Palghat gap, up to south Kanara (Subramanian *et al.,* 2018). Thus, they are distributed in Coorg, Nilgiris and Annamalai Landscapes. *Macromia indica* Fraser, 1924 is found in WG north of Palghat gap according to Subramanian *et al.* (2018). Thus, the current distribution is Coorg, Wayanad and Nilgiris Landscapes of WG north of Palghat gap. As there is no recent record from Kerala, this species is included based on Subramanian *et al.* (2018). *Macromia irata* Fraser, 1924 (Fig. 6C) is not an uncommon species in the lower elevations and foot hills of all the landscapes in Kerala; from Vythiri, Malabar, Wayanad, Kerala (Fraser 1931, 1936) and WG above the Palghat gap till Coorg (Subramanian *et al.,* 2018) and Thenmalai (KS). *Macromia flavicincta* Selys, 1874 is included based on a single record from Ponmudi Hills (KS). Except *M. cingulata, M. flavocolorata,* and *M. flavicincta,* all other *Macromia* species are endemic to WG.

Anisoptera Genera, *Incertae Sedis*

The dragonflies belonging to the genera *Idionyx* and *Macromidia* are currently treated as *Incertae Sedis* since their family level affinities are not known (Kalkman *et al*., 2020). These are medium sized, slow flying odonates characterized by their dipping flight and loose gregarious assemblages. Generally they are insects of jungles and foothills. Larvae are washed down in monsoons and adults may eclose in the midlands and plains, only to ascend the streams to reach their breeding grounds. The groups are represented by two genera, *Macromidia* Martin, 1907 and *Idionyx* Hagen, 1867.

Genus *Idionyx* Hagen, 1867

Idionyx are generally montane species seen above 800 m in the state, though the larvae may be washed down to emerge at the foot hills in strong pre–

monsoon rains. There are nine species in Kerala and ten in WG. *Idionyx nilgiriensis* (Fraser, 1918) has not been recorded from Kerala. *Idionyx corona* Fraser, 1921 (Fig. 5A) and *I.c. burliyarensis* (Fig. 5F) are not uncommon in Kerala. The recent records of the species are Thusharagiri (Palot and Emilyamma, 2015), Silent Valley (Subramanian *et al.* 2013), Mathikettan Shola (KS), Neriamangalam (KS), Achankovil (KS), Ponmudi Hills (KS), Shendurney WLS (KS), Peppara WLS (KS). *Idionyx galeata* Fraser, 1924 is an uncommon species recorded from Aaralam (Palot and Kiran, 2016), Kurichiyar Mala, Wayanad (Emiliyamma *et al*., 2007), Achankovil RF (KS), Ponmudi Hills (KS), Shendurney WLS (KS) and Peppara WLS (KS). *Idionyx minima* Fraser, 1931 (Fig. 5E) is relatively rare and records are from Aaralam (KS), Muthanga (Emiliyamma in Subramanian *et al.,* 2013), Rajakkad, Munnar (KS), Mathikettan Shola (KS), Ponmudi Hills (KS), Shendurney WLS (KS) and Peppara WLS (KS). *Idionyx nadganiensis* Fraser, 1924 was described from Nadgani Ghat (Malappuram) in Nilgiri–Wayanad; there are no recent records of the species. *Idionyx periyashola* Fraser, 1939 was described probably from eastern slopes of Munnar High Range; however, there is no other record of the species. *Idionyx nilgiriensis* (Fraser, 1918) is known only from its original description from the Nilgiri Landscape. There are no recent records from Kerala and even from Nilgiris. *Idionyx rhinoceroides* Fraser, 1934 is a rare species with records from Thusharagiri (Palot and Emilyamma, 2015) and Dhoni (Emiliyamma *et al*., 2007). *Idionyx saffronata* Fraser, 1924, is the commonest member of the genus and has been recorded in all major landscapes of Kerala. The localities include Aaralam (Palot and Kiran, 2016), Payyavoor and Kottiyoor (Vibhu V, per. com.), Vannathimala (Emiliyamma *et al*., 2007), Thusharagiri (Palot and Emilyamma, 2015; Emiliyamma *et al*., 2007), Malabar WLS (MJP), Silent Valley (Subramanian *et al*., 2013), Anamalais (Fraser, 1936), Nelliampathies (KS), Thattaekkad (Varghese *et al*., 2014), Periyar Tiger Reserve (KS), Punalur RF (KS), Achankovil (KS), Shendurney WLS (KS), Peppara WLS (KS) and Neyyar WLS (KS). *Idionyx travancorensis* Fraser, 1931 (Fig. 5B), is a common species of mid to high elevations of Anamalais and Agasthyamalais. The regional records are from Thusharagiri (Palot and Emilyamma, 2015), Silent Valley (KS), Munnar (Fraser, 1936), Mathikettan Shola (KS), Thattaekkad (KS), Periyar Tiger Reserve (KS), Punalur RF (KS), Achankovil (KS), Shendurney WLS (KS), Ponmudi Hills (KS) and Peppara WLS (KS). *Idionyx gomantakensis* Subramanian, Rangnekar & Nayak, 2013 recorded from Punalur RF (KS), Shendurney WLS (KS), Ponmudi Hills (KS) and Peppara WLS (KS).

Genus *Macromidia* Martin, 1907

The genus has only one species in Kerala and WG, *M. donaldi donaldi* (Fraser, 1924) (Fig. 5D), which is a relatively uncommon species in foothills up to 800 m. Regional records are Aravanchal sacred grove, Kannur district (MJP), Kasaragod (KS), Thamaracherry (Fraser 1936), Nelliampathies, and Vazhachal (KS), Thattaekkad (Varghese *et al*., 2014), Kadavoor (Jose 2016), Periyar Tiger Reserve (KS), Edamalayar, Pooyamkutty (KS) Achankovil (KS), Shendurney WLS (KS), Ponmudi Hills (KS), Peppara WLS (KS).

Suborder Zygoptera Selys, 1854

Superfamily Lestoidea Calvert, 1901

Family Lestidae Calvert, 1901

Lestidae in Kerala comprises three genera, *Indolestes* Fraser, 1922 (2 species), *Lestes* Leach, 1815 (8 species) and *Platylestes* (Selys, 1862). *Platylestes* has been added to Kerala fauna with a single species *P. platystylus* Rambur, 1842 and its distribution is discussed. Recently, Emiliyamma *et al*. (2020) reported a new species *P. kirani* Emiliyamma, Palot & Charesh, 2020 from the coastal areas of Kannur district.

Genus *Indolestes* Fraser, 1922

Indolestes is represented by two endemic species, *I. gracilis davenporti* (Fraser, 1930) and *I. pulcherrimus* Fraser, 1924 in WG, and both have been reported in Kerala. *Indolestes gracilis*

davenporti (Fig. 8G) has been reported from Wayanad (KS), Nelliampathies–Anamalais (KS), Anjanad Valley (KS), High Ranges (KS; AS), Cardamom hills (KS; MJP) and Pandalam Hills landscapes (Pradeepkumar *et al*., 2014; KS). *Indolestes pulcherrimus* (Fig. 8H) was recently reported by Muneer PK (per. com.) from Wayanad.

Genus *Lestes* Leach, 1815

Lestes comprises eight species in WG and seven species in Kerala. *Lestes dorothea* Fraser, 1924 (Fig. 9A) has been reported for the first time from Kerala by Thumboor and Jose (2018) from Athirapally, Thrissur. It is comparatively larger than *L. praemorsus decipiens* (Fig. 9B), mostly found in company with it and absence of markings on segment 8, 9 and higher postnodal index serve to distinguish it. It has been reported from Coorg–Kannur (VPN), Wayanad (MJP; Manoj.P, per. com.), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Manoj P, per. com.; KS), Lower Periyar (Thumboor and Jose, 2018; KS), Cardamom Hills (KS) and Pandalam Hills landscapes (AS; KS; Manoj P, per. com.). *Lestes elatus* Hagen in Selys, 1862 is the commonest *Lestes* found in WG and Kerala around pools and tanks in monsoon months and hiding in scrub jungles during summer (Fraser, 1933). Its flight is short and when settled, like *L. praemorsus decipiens* and *P. platystylus* and it has the peculiar habit of swaying its abdomen. It can be separated from other *Lestes* by its metallic thoracic stripe with only an upper dilatation. It has been reported from Coorg–Kannur (Palot and Radhakrishnan, 2005; Palot and Kiran, 2016; Nair, 2017; VPN), Wayanad (Emiliyamma *et al*., 2007; MJP), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Palghat plains (Palot *et al.,* 2005), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (Emiliyamma *et al.,* 2007; KS), Pandalam Hills (KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; VPN; KS), and Coastal Wetlands landscape (Roshnath, 2020). *Lestes malabaricus* Fraser, 1929 (Fig. 9F) is a rare in Kerala and WG. Fraser (1933) reported its annual migration northwards to north Malabar just before the south west monsoon. The superior appendages which are bent sharply inwards at the junction of apical and middle thirds at right angles and the shape of metallic humeral stripes help to separate it from the related ones. It has been reported from Coorg–Kannur (Palot and Radhakrishnan, 2005; KS), Palghat (Palot *et al.,* 2005), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; KS) and Agasthyamalai landscapes (KS). *Lestes nodalis* Selys, 1891 was first reported from Kerala by Emiliyamma and Palot (2016 a). The longitudinally bicolorous pterostigma and peculiar anal appendages help to distinguish it. It is restricted to north of Palghat gap. It has been reported from Coorg–Kannur (VPN; Balakrishnan VC, per. com.; MJP), Wayanad (Emiliyamma and Palot, 2016 a), Nilgiri–Silent valley (KS) and Palghat Hills landscapes (KS). *Lestes patricia* Fraser, 1924 is a very rare odonate both in WG and Kerala. It can be separated from other *Lestes* by a single mid-dorsal black band with straight borders. Subramanian *et al.* (2018) mentioned its occurrence in Kerala and is endemic to WG. There are reports of its occurrence in Jammu and Kashmir and Pakistan which has to be confirmed (Kalkman *et al.,* 2020). *Lestes praemorsus decipiens* Kirby, 1893 has been reported from Coorg – Kannur (Nair, 2014; Palot and Kiran, 2016), Wayanad (VPN; Palot and Emiliyamma, 2015; Susanth and Anooj, 2020), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS; VPN) and Coastal wetland landscapes (KS; Raju, 2007) as well as the temporary pools of midland hillocks of Kannur and Kasaragod districts (MJP). *Lestes concinnus* Hagen in Selys, 1862, has been synonymized with *L. umbrinus* Selys, 1891 and *L. thoracicus* Laidlaw, 1920 (Kalkman *et al.*, 2020). It has been reported from Palakkad Hills (KS), Nelliampathies–Anamalais (KS), Lower Periyar (KS), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalais landscapes (KS; VPN; AS). *Lestes viridulus* Rambur, 1842, has been reported from WG but not yet from Kerala.

Genus *Platylestes* Selys, 1862

Platylestes is represented by two species in WG and Kerala. *Platylestes platystylus* Rambur, 1842 (Fig. 9C), a beautiful insect with green eyes and characteristic anal appendages, is found near paddy fields and ponds. Its flight period is April - August and is reported from Coorg–Kannur (VPN; MJP; Balakrishnan VC, per. com.), Nilgiri–Silent Valley (VPN), Palghat Hills (KS), Nelliampathies–Anamalais (AS; KS), Lower Periyar (KS), Cardamom Hills (KS), Pandalam Hills (KS) and in midland hills of northern Kerala (MJP). *Platylestes kirani* Emiliyamma, Palot & Charesh, 2020 has been recently described from the coastal wetlands of Kannur district (Emiliyamma *et al.,* 2020). It is very similar to *P. platystylus* and can be distinguished from the latter by the broad black marking on the synthorax and the blunt and round apex of the superior anal appendages (Fig. 9D). Flight period is August to November and is commonly found near paddy fields, ponds and mangrove swamps in Kannur district. It has been reported from Coorg–Kannur (VPN), Nelliampathies–Anamalais (AS) and Coastal wetland landscapes (Emiliyamma *et al.,* 2020). It has been recorded by VPN from Varadoor, Kannur district in 2018.

Superfamily Platystictoidea Kennedy, 1920

Family Platystictidae Kirby, 1890

Family Platystictidae includes two genera–*Indosticta* (1 species) and *Protosticta* (12 species) in WG and Kerala (12 species) and all are WG endemics.

Genus *Indosticta* Bedjanič, 2016

Indosticta deccanensis Laidlaw, 1915 (Fig. 10B), a medium sized saffron damsel with turquoise blue terminal abdominal segments, is a rare damsel in WG and Kerala found in streams with dense riparian vegetation and the unique blue spot of the tail is distinct from its dark surroundings (Subramanian, 2009). It is a WG endemic species considered vulnerable as per IUCN. *Indosticta* is a monotypic genus with *I. deccanensis* represented in WG and Kerala and is an uncommon species distributed in all the landscapes of Kerala below 900 m elevation. It is the sole representative of *Indosticta* Bedjanič, 2016, in the region. The site records are Aaralam of Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (KS) of Wayanad landscape, Silent Valley (KS) of Nilgiri–Silent Valley landscape, Chimmony (Gnanakumar *et al.,* 2012), Athirapally and Peechi (KS) of Nelliampathies–Anamalais landscape, Thattaekkad (Varghese *et al*., 2014) and Pooyamkutty (KS) of Lower Periyar landscape, Periyar Tiger Reserve (KS), Idukki (KS) and Kattappana (KS) of Cardamom Hills landscape, Konni (Pradeepkumar *et al*., 2014) and Achankovil (KS) of Pandalam Hills landscape, Rockwood in Shendurney WLS, Ponmudi–Kallar valley (KS), Peppara and Neyyar (KS) of Agasthyamalais landscape.

Genus *Protosticta* Selys, 1885

Protosticta Selys, 1885, consists of zygopterous damselflies of small size and slender built commonly called Reed–tails or Shadow–damsels, inhabiting hill streams of tropical, subtropical and temperate jungles of Indian subcontinent and south-east Asia. In India, they are distributed in the WG and in the north–eastern region towards Burma (Fraser, 1933). The genus was described from Sulawesi (Celbes) in Indonesia, with *P. simplicinervis* Selys as the type species. Genus *Protosticta* has 49 extant species (Paulson *et al.,* 2021), distributed from Pakistan through Indian subcontinent to Indo–China and south-east Asian Islands (van Tol, 2000). There are 15 species of *Protosticta* in the Indian region and 12 in WG of Peninsular India of which 11 are found in Kerala. These are *P. gravelyi* Laidlaw, 1915 (Fig. 10D); *P. hearseyi* Fraser, 1922; *P. sanguinostigma* Fraser, 1922; *P. antelopoides* Fraser, 1924; *P. mortoni* Fraser, 1924 (Fig. 10F); *P. davenporti* Fraser, 1931; *P. rufostigma* Kimmins, 1958 (Fig. 10E); *P. ponmudiensis* Kiran, Kalesh & Kunte, 2015; *P. monticola* Emiliyamma & Palot, 2016; *P. cyanofemora* Joshi, Subramanian, Babu & Kunte, 2020; and *P. sholai*, Subramanian & Babu 2020. *Protosticta myristicaensis* Joshi & Kunte, 2020 was reported only from its type locality in Karnataka (WG). van

Tol (2000) commented that *P. mortoni* Fraser, 1924 may be a synonym of *P. gravelyi* Laidlaw, 1915. Subsequently, Subramanian *et al.* (2018) did not include it in the WG list. However, later Joshi *et al.* (2020) reinstated *P. mortoni* Fraser, 1924. *Protosticta antelopoides* Fraser, 1931 is a rare species with very few records. The reports from Kerala are Thusharagiri (Palot and Emilyamma, 2015) and Malabar WLS (MJP) of Wayanad landscape and Munnar (Fraser, 1933) of High Range Landscape. *Protosticta cyanofemora* Joshi, Subramanian, Babu & Kunte, 2020 was recently described from Pandimotta in Shendurney WLS (Agasthyamalais landscape). KS has photographed the species from KMTR and it was also sighted at Peppara WLS (Agasthyamalais landscape). *Protosticta davenporti* Fraser, 1931 is restricted to the Anamalai Hills and the type locality is Anamalais and Mudis Hills, Tamil Nadu 3000 – 4000 ft (Fraser, 1931, 1933); Munnar (Fraser, 1933). The specific records are from Mathikettan shola NP (KS) of High Range landscape. *Protosticta gravelyi* Laidlaw, 1915 is a common damselfly distributed throughout the lower foothills of WG of Kerala. Regional records are Aaralam (Palot and Kiran, 2016), Vythiri, Wayanad (Fraser, 1931), Thusharagiri (Palot and Emiliyamma, 2015), Malabar WLS (MJP), Silent Valley (KS), Nilambur (Fraser 1933), Chimmony and Peechi (KS), Chinnar (Adarsh *et al*., 2015), Marayur (KS), Munnar (KS), Thattaekkad (Varghese *et al*., 2014), Periyar Tiger Reserve (KS), Konni (Pradeepkumar *et al*., 2014), Achankovil (KS), Shendurney WLS, Ponmudi(KS), Peppara and Neyyar (KS). The species was also recorded from the wetland habitats of sacred groves in midland hills of Kannur and Kasaragod districts (MJP). *Protosticta stevensi* was described from Coonoor–Mettupalayam by Fraser in 1922, differing from *P. gravelyi* in the abdominal segment 8 being entirely black in *P. gravelyi*, while basal one-third to half is bluish white in *P. stevensi*. Later, this taxon was recognized as a variant of *P. gravelyi* and hence synonymized with *P. gravelyi* by Fraser (1931) after his personal examination of the types in Selys collections. *Protosticta hearseyi* Fraser, 1922 is an uncommon species and the type locality was Gudalur, Nilgiris, Tamil Nadu 4500 ft, collected in June (Fraser, 1922), other historical records are Ouchterlony Valley in Nilgiris and Mudis in Anamalais 3000 ft (Fraser, 1931). The species has been reported from Aaralam (Palot and Kiran, 2016) and New Amarambalam region by Fraser (1933) and later by Emiliyamma (2014). *Protosticta sanguinostigma* Fraser, 1922 (Fig. 10H) is a common species seen from 200–1200 m. The locality records from Kerala are Aaralam (Palot and Kiran, 2016), Thusharagiri (Palot and Emilyamma, 2015), Vythiri (Fraser 1933), Malabar WLS (MJP), Nilambur (Fraser 1931), Silent Valley (KS), Dhoni (Fraser 1924), Mankulam and Kallar (KS), Thattaekkad (Varghese *et al.,* 2014), Neriamangalam (KS), Achankovil (KS), Rockwood in Shendurney WLS, Ponmudi (KS), Bonaccord, Peppara and Neyyar (KS). *Protosticta monticola* Emiliyamma & Palot, 2016 is a rare and local montane shola species recorded only from the High Ranges of Munnar. The type locality is Kambilipparachola and Nagamalachola of Marayur forest division and Mathikettan Shola National Park in Idukki District, Annamalai Hills, Kerala State, India (Emiliyamma and Palot, 2016 b). Recent records are from montane forests of Bhadrakali Shola in Eravikulam National Park, and Chinna–Poovar, in higher reaches of Chinnar Wildlife Sanctuary in Kerala (KS). *Protosticta mortonii* Fraser, 1924 is a species that was described from Sampaje Ghat in Coorg, Karnataka, by Fraser. The regional records are Wayanad (Emiliyamma, 2014) and Aaralam WLS (MJP). *Protosticta ponmudiensis* Kiran, Kalesh & Kunte, 2015 is a rare and local species (Fig. 10G) described from Ponmudi hills in Agasthyamalais. The species has not been found outside its type locality in Ponmudi–Kallar valley in Trivandrum. *Protosticta rufostigma* Kimmins, 1958 was not known from Kerala or Western Ghats after its initial description. In 2006, the species was photographed from Malabar WLS (KS & MJP); Bonaccord Estate, 800 m, 2006 January, April 2012; May–June 2013 in Ponmudi, 900 m, in Trivandrum; Pandimotta in Shendurney 900 m, May 2017 in Kollam and Kakkayam in Malabar Wildlife Sanctuary January 2013. The recently described species, *P. sholai* Subramanian & Babu, 2020, was recorded from Manalar, in Periyar Tiger Reserve (KS).

Superfamily Calopterygoidea Selys, 1850

Family Calopterygidae Selys, 1850

Calopterygoidea includes three families, Calopterygidae Selys, 1850, Chlorocyphidae Cowley, 1937 and Euphaeidae Yakobson & Bainchi, 1905. These are large iridescent colored damselflies with broad head, conspicuous round eyes and broad rounded hindwing. Calopterygidae comprises two genera and four species both in WG and Kerala.

Genus *Neurobasis* Selys, 1853

Neurobasis in WG and Kerala is represented by *Neurobasis chinensis* (Linnaeus, 1758) and is a widespread species in most of Asia, found from sea level up to 7500 ft, but common at 3000–4000 ft (Fraser, 1934). It is a riverine insect and breeds in montane and submontane streams and is reported from Coorg – Kannur landscape (Nair, 2014; Emiliyamma, 2014; Palot and Kiran, 2016), Wayanad landscape (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007; KS), Palakkad Hills (KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,*2012; KS), Anjanad Valley (Adarsh *et al*., 2015), High Ranges (Sadasivan, 2018; KS), Lower Periyar (Emiliyamma *et al*., 2007; Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS) Pandalam Hills (Pradeepkumar *et al*., 2014; KS) and Agasthyamalais landscape (KS).

Genus *Vestalis* Selys, 1853

It is a gregarious insect breeding in montane and submontane streams. In forests, large colonies are found inhabiting the rides of open spaces and along shaded pathways and almost every twig would be found occupied by it (Fraser, 1934). Females generally oviposit on blades of grass or juicy stems overhanging the streams, several feet above the water surface, larvae drop down into streams later. Genus *Vestalis* includes three species in WG and Kerala. *Vestalis apicalis* Selys, 1873 is a large damsel having metallic green thorax with long, less iridescent green and more coppery abdomen with wing tips blackish brown. It has the apex of all wings broadly tipped to blackish brown about 5 mm and cheeks bright yellow. Commonly found along hill streams, large numbers can be found resting among bushes in forest paths in association with its congener *V. gracilis* (Subramanian, 2009). It has been reported from Coorg–Kannur landscape (Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Wayanad landscape (VPN; Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007; KS), Palghat hills (Emiliyamma *et al*., 2007; KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Anjanad Valley (Adarsh *et al*., 2015), High ranges (KS), Lower Periyar (KS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; Emiliyamma, 2014; KS), Agasthyamalai landscape (Emiliyamma and Radhakrishnan, 2002; KS), and coastal wetlands landscape (Raju, 2007; Roshnath, 2020). *Vestalis gracilis* (Rambur, 1842) shares the habitat of *V. apicalis,* and *V. gracilis* can be separated by its clear wing tips. *V. gracilis* has been reported from Coorg – Kannur landscape (Palot and Radhakrishnan, 2005; Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Wayanad landscape (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley landscape (KS), Palghat Hills (KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Anjanad Valley (Adarsh *et al*., 2015), High Range (KS), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; Emiliyamma, 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetlands landscapes (Raju, 2007; Roshnath, 2020). *Vestalis submontana* Fraser, 1934 was described by Fraser (1934) as *V. gracilis submontana,* however, Hamalainen (2011) recognized it as a distinct species and upgraded its status to *V. submontana* Fraser, 1934 (Fig. 7A). It is an Indian endemic species and a high altitude species found only above 800 m. It can be distinguished from *V. apicalis* by the glossy black genae; much restricted black apex

of wing and peculiar shape of anal appendages. It has been reported from Coorg–Kannur landscape (Emiliyamma, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP), Nilgiri–Silent Valley landscape (Emiliyamma *et al*., 2007; KS), Palghat Hills (Emiliyamma *et al*., 2007), Nelliampathies – Anamalais (Emiliyamma and Radhakrishnan, 2000; KS), Anjanad Valley (KS), High Ranges (KS), Lower Periyar (Emiliyamma, 2005), Cardamom Hills (KS) and Agasthyamalais landscape (Emiliyamma and Radhakrishnan, 2002; KS).

Family Chlorocyphidae Cowley, 1937

These are small damselflies with large bulb-like eyes, protruding face, short and stout thorax, iridescent male wings, transparent female wings and cylindrical abdomen shorter than hindwings (Subramanian, 2009). Three genera *viz., Calocypha* Fraser, 1928, *Heliocypha* Fraser, 1949 and *Libellago* Selys, 1840 are found with single species each, both in WG and Kerala.

Genus *Calocypha* Fraser, 1928

Calocypha Fraser is represented by *Calocypha laidlawi* (Fraser, 1924) in WG and Kerala and is endemic to WG. It is an azure blue and black damsel with vermilion marks on the thorax and forehead (Fig. 7B). The damsel is closely associated with Myristica swamps of WG and breeds in the streams of the swamps (Subramanian, 2009). It is commonly found along with *Heliocypha bisignata* in streams. Rarely it is seen associated with the streams of swamps in other areas. It has been reported from Wayanad landscape (Fraser, 1934), Nelliampathies –Anamalais (KS; Thumboor, 2018), High Ranges (KS), Lower Periyar (Varghese *et al*., 2014), Cardamom hills (KS), Pandalam Hills (KS) and Agasthyamalai landscape (KS).

Genus *Heliocypha* Fraser, 1949

Heliocypha Fraser is represented by *Heliocypha bisgnata* (Hagen in Selys, 1853) both in WG and Kerala and it is endemic to India. It is a small black and red damsel with red iridescent streaks on wings. It is widespread in hill streams where it breeds (Subramanian, 2009). It is also found associated with streams of wooded country. It has been reported from Coorg–Kannur landscape (Palot and Kiran, 2016; Nair, 2017), Wayanad (Emiliyamma *et al*., 2007; MJP; Palot and Emiliyamma 2015, Susanth and Anooj, 2020), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007; KS), Palghat Hills (Emiliyamma *et al*., 2007), Nelliampathies – Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; KS), Anjanad Valley (Adarsh *et al*., 2015), High Range (KS), Lower Periyar (Emiliyamma, 2005; AS; Varghese *et al*., 2014), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; Emiliyamma, 2014; KS) and Agasthyamalai landscape (Emiliyamma and Radhakrishnan, 2002; KS).

Genus *Libellago* Selys, 1840

Libellago Selys is represented by *Libellago indica* (Fraser, 1928) both in WG and Kerala and is endemic to WG. It is a small black and yellow damsel with black–tipped transparent wing and is confined to hill streams and rivers of forested landscapes (Subramanian, 2009) and is a common damsel in the streams of wooded country. It has been reported from Coorg–Kannur landscape (Emiliyamma *et al*., 2007; Palot and Kiran, 2016; Nair, 2017), Wayanad (Palot and Emiliyamma 2015, Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Anjanad Valley (Adarsh *et al*., 2015), High ranges (Sadasivan, 2018), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalai (KS) and coastal wetland landscapes (Raju, 2007).

Family Euphaeidae Yakobson & Bainchi, 1905

Euphaeidae is represented by the genera *Dysphaea* Selys, 1853 (one species) and *Euphaea* Selys, 1840 (three species) both in WG and Kerala. Bhakare *et al.* (2021) recently described two new species, *Euphaea pseudodispar* Sadasivan & Bhakare, 2021 and *Euphaea thosegharensis* Sadasivan & Bhakare, 2021 from northern WG.

Genus *Dysphaea* Selys, 1853

Dysphaea is represented by a single species, *D. ethela* Fraser, 1924 and is endemic to India. It is a large black damsel with amber colored wings (Fig. 8C) and is found in torrential hill streams from 50-–1000 m a.s.l. It is rare and usually sits in the middle of streams on boulders or emergent twigs (Subramanian, 2009). It is found in Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Adarsh *et al*., 2014; KS), Anjanad Valley (Adarsh *et al*., 2015, KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (AS; KS) and Agasthyamalai landscape (AS).

Genus *Euphaea* Selys, 1840

Euphaea is represented by three species both in WG and Kerala and all are endemic to WG. Recent additions are *E. pseudodispar* and *E. thosegharensis* from Maharashtra. *Euphaea cardinalis* (Fraser, 1924) is a large bright ochre and black damsel (Fig. 8D) with half of the underside of the hindwings iridiscent blue. It is found perched on boulders and riparian vegetation of second-order streams (Subramanian, 2009). It is a montane species generally found above 900 m though occasionally reported from foothills after monsoons and restricted to south of Palakkad gap. It has been reported from Nelliampathies–Anamalais (KS), High ranges (KS), Cardamom Hills (KS; Emiliyamma *et al*., 2007) and Agasthyamalais landscape (KS). *Euphaea dispar* (Rambur, 1842) (Fig. 8E) is a montane species found in streams of evergreen forests North of Palakkad gap from 700 to 1828 m and rarely much below after rains. It has been reported from Coorg–Kannur (Palot and Kiran, 2016), Wayanad (Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS) and Palghat hills landscape (KS; VPN). *Euphaea fraseri* (Laidlaw, 1920) (Fig. 8F) is common in hill streams from about 50–1000 m and males have a habit of displaying iridescent copper markings on the upper hindwing (Subramanian, 2009). It can be seen up to 2000 m in forests and is common in the streams of sacred groves and wooded country. It is found in Coorg–Kannur landscape (Nair, 2017; VPN; Palot and Kiran, 2016), Wayanad (Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (KS), Anjanad Valley (KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS) and Agasthyamalai landscape (KS). It has been rarely recorded from streams in lowland sacred groves in northern Kerala (MJP).

Family Platycnemididae Yakobson & Bainchi, 1905

Platycnemididae includes 10 genera, *Caconeura* Kirby, 1890, *Copera* Kirby, 1890, *Disparoneura* Selys, 1860, *Elattoneura* Cowley, 1935, *Esme* Fraser, 1922, *Melanoneura* Fraser, 1922, *Onychargia* Selys, 1865, *Phylloneura* Fraser, 1922, *Prodasineura* Cowley, 1934 and *Pseudocopera* Fraser, 1922 in WG, and all except *Pseudocopera,* found in Kerala.

Genus *Caconeura* Kirby, 1890

Caconeura includes four species in WG and three in Kerala. Except *C. t–coerulea,* the other three are found in Kerala. In *Caconeura,* anal bridge is incomplete curving down to meet the posterior margin of the wing. *Caconeura gomphoides* (Rambur, 1842) is a very rare odonate in Kerala. It has been included in this account as per the reports of Kiran and Raju (2013). According to them it is found in North Kerala. It is endemic to WG and no recent records are available. *Caconeura ramburi* (Fraser, 1922) is usually found perched on riparian vegetation along shaded streams (Subramanian, 2009). It is an Indian endemic. It has been reported from Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (MJP; Palot and Emiliyamma, 2015), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS) and Agasthyamalai landscape (AS). *Caconeura risi* (Fraser, 1931) is endemic to WG. It is a medium sized azure blue and black damsel (Fig. 9G) usually found perched on riparian vegetation (Subramanian, 2009). It is found at Coorg–Kannur landscape

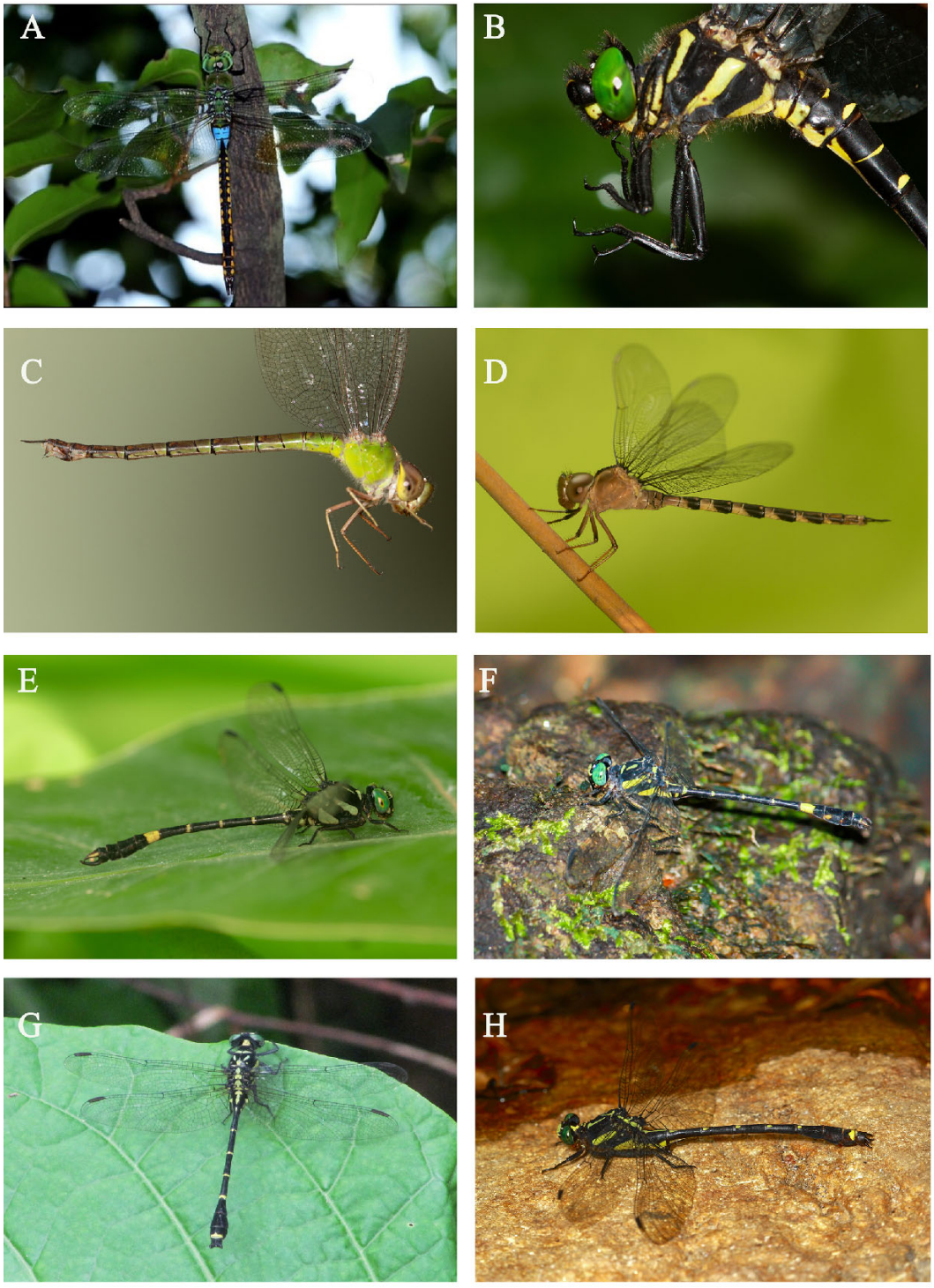

Fig. 1 A – *Anax indicus* Lieftinck,1942 © Suhas RK; B – *Chlorogomphus xanthoptera* (Fraser, 1919) © Kalesh Sadasivan; C – *Gynacantha millardi* Fraser,1920 © Kalesh Sadasivan; D – *Gynacantha dravida* Lieftinck,1960 © Kalesh Sadasivan; E – *Melligomphus acinaces* Laidlaw, 1922) © Kalesh Sadasivan; F – *Acrogomphus fraseri* Laidlaw, 1925 © Toms Augustine; G – *Burmagomphus laidlawi* Fraser, 1924 © Kalesh Sadasivan; H – *Asiagomphus nilgiricus* Laidlaw, 1922 © Kalesh Sadasivan

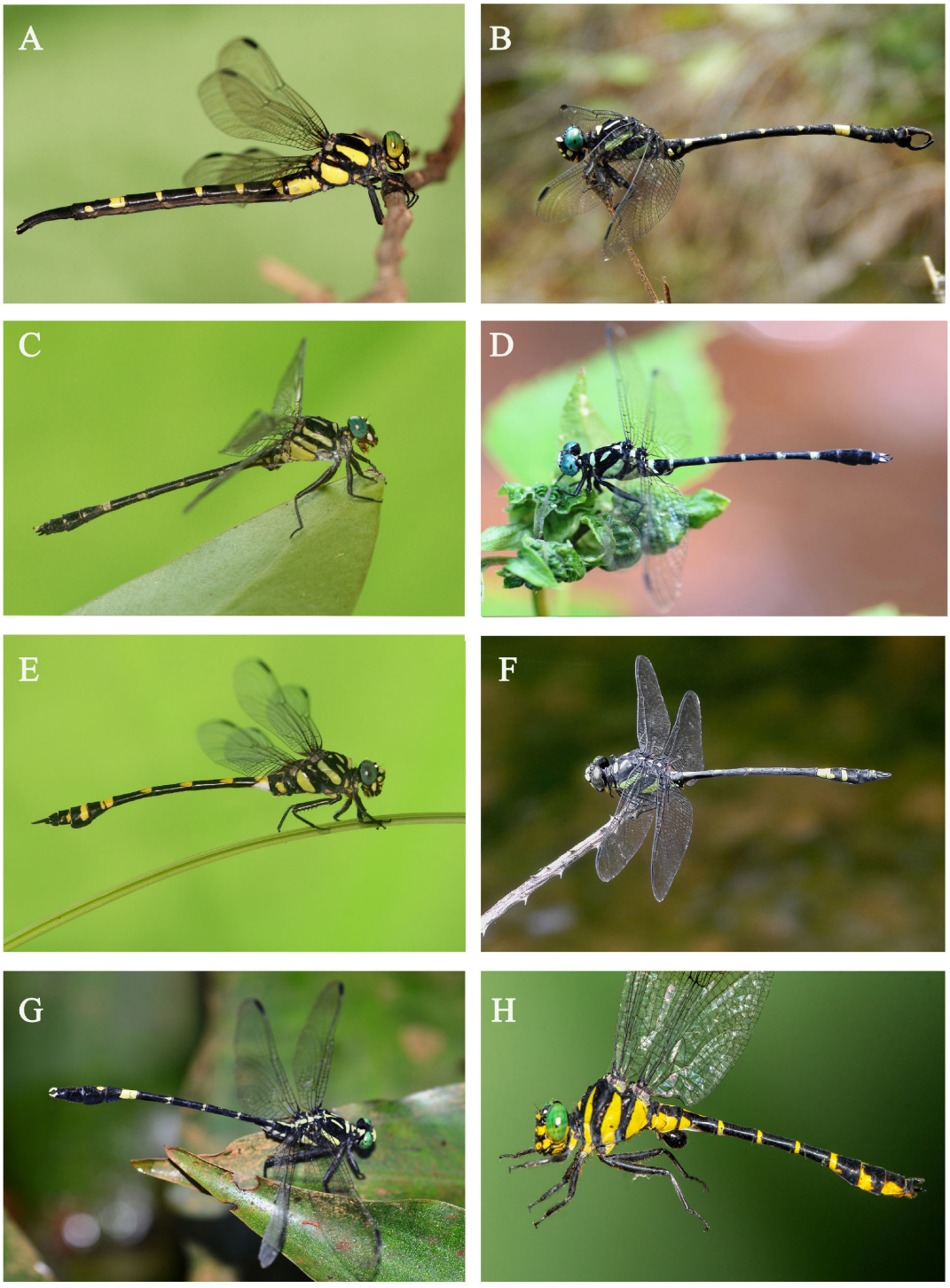

Fig. 2 A – *Macrogomphus wynaadicus* Fraser, 1924 © Kalesh Sadasivan; B – *Lamelligomphus nilgiriensis* (Fraser, 1922*)* © Sharan V; C – *Heliogomphus promelas* (Selys, 1873) © Kalesh Sadasivan; D – *Microgomphus souteri* Fraser, 1924 © Vinayan P Nair; E – *Ictinogomphus rapax* (Rambur, 1842) © Kalesh Sadasivan; F – *Gomphidia kodaguensis* Fraser, 1923 © Kalesh Sadasivan; G – *Merogomphus tamaracherriensis* Fraser, 1931 © Vinayan P Nair; H – *Cyclogomphus flavoannulatus* Rangnekar, Dharwadkar, Kalesh & Subramanian, 2019 © Kalesh Sadasivan

Fig. 3 A – *Crocothemis erythraea* (Brulle´, 1832) © Kalesh Sadasivan; B – *Indothemis limbata sita* Campion, 1923 © Munner PK; C – *Sympetrum fonscolombi* (Selys, 1840) © Abraham Samuel; D – *Indothemis* carnatica (Fabricius, 1798) © Abraham Samuel; E – *Lyriothemis acigastra* (Selys, 1878) © Vinayan P Nair; F – *Lyriothemis tricolor* Ris, 1919 © Kalesh Sadasivan; G – *Rhyothemis triangularis* Kirby, 1889 © Vinayan P Nair; H – *Epithemis mariae* (Laidlaw, 1915) © Kalesh Sadasivan

Fig. 4 A – *Orthetrum triangulare triangulare* (Selys, 1878) © Kalesh Sadasivan; B – *Onychothemis testacea ceylanica* Ris, 1912 © Vinayan P Nair; C – *Cratilla lineata calverti* (Forster, 1903) © Kalesh Sadasivan; D – *Tetrathemis platyptera* Selys, 1878 © Kalesh Sadasivan; E – *Hylaeothemis apicalis* Fraser, 1924 © Kalesh Sadsivan; F – *Zyxomma petiolatum* Rambur, 1842 © Kalesh Sadasivan; G – *Urothemis signata* (Rambur, 1842) © Abraham Samuel; H – *Pantala flavescens* (Fabricius, 1798) © Abraham Samuel

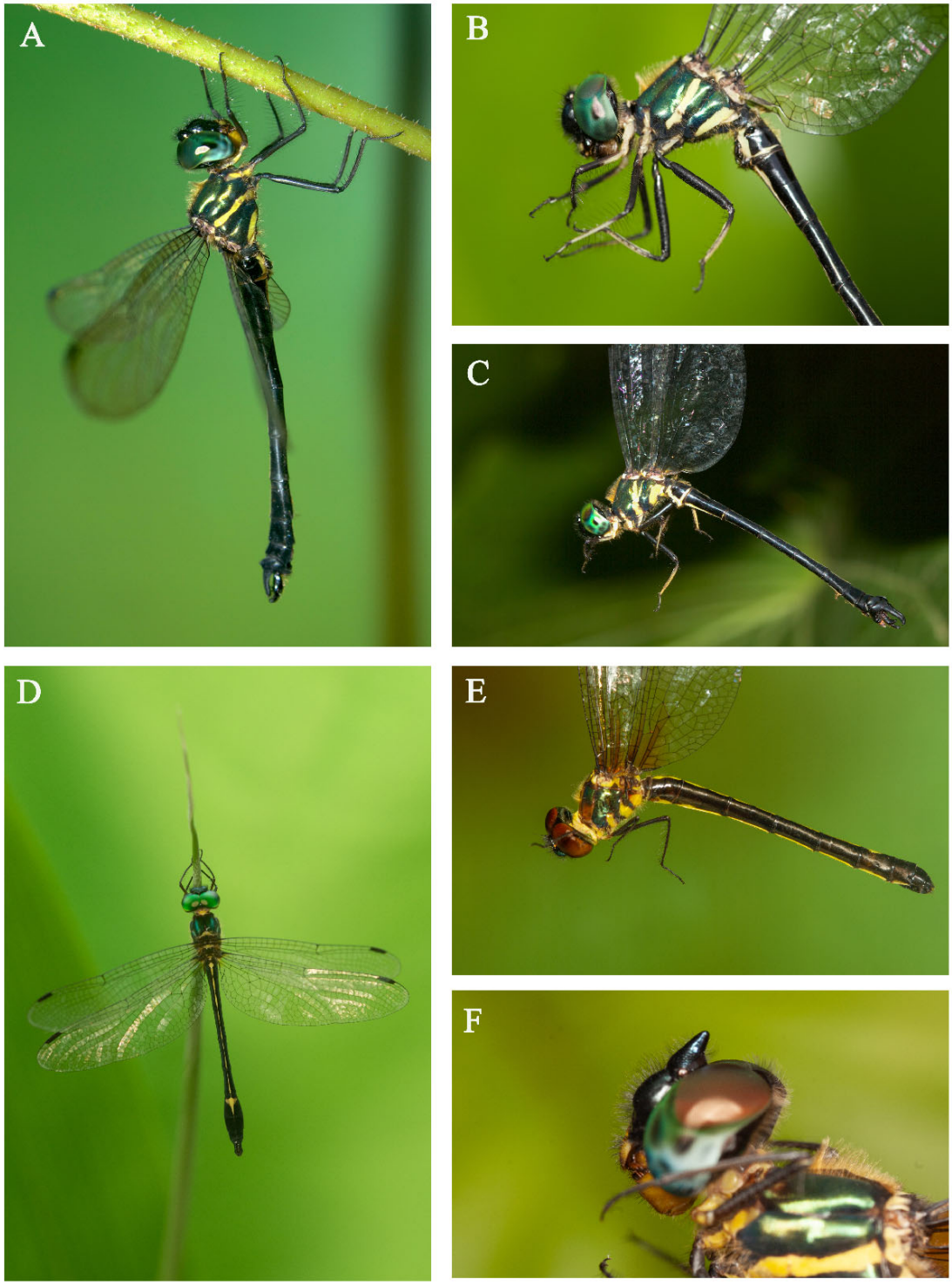

Fig. 5: A – *Idionyx corona* Fraser, 1921 © Kalesh Sadasivan; B – *Idionyx travancorensis* Fraser, 1931 © Kalesh Sadasivan; C – *Idionyx saffronata* Fraser, 1924 © Kalesh Sadasivan; D – *Macromidia donaldi donaldi* (Fraser, 1924) © Kalesh Sadasivan; E – *Idionyx minima* Fraser, 1931 © Kalesh Sadasivan; F – *Idionyx corona burliyarensis* Fraser, 1924 © Kalesh Sadasivan

Fig. 6: A – *Macromia ellisoni* Fraser, 1924© Kalesh Sadasivan; B – *Macromia cingulata* Rambur, 1842 © Kalesh Sadasivan; C – *Macromia irata* Fraser, 1924 © Kalesh Sadasivan; D – *Macromia bellicosa* Fraser, 1924 © Daniel VR; E – *Macromia flavocolorata* Fraser, 1922 © Biju PB

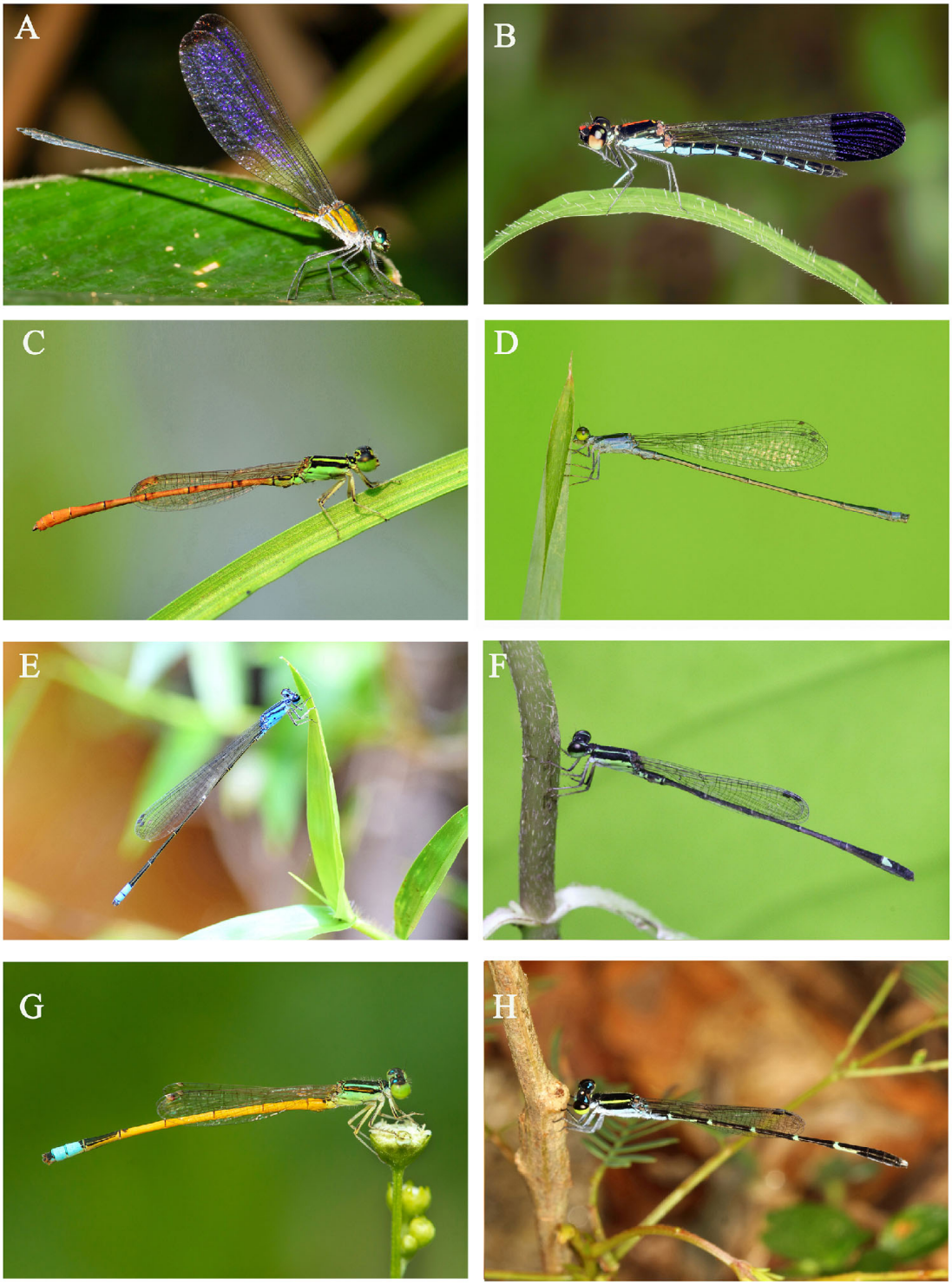

Fig. 7 A – *Vestalis submontana* Fraser, 1934 © Kalesh Sadasivan; B – *Calocypha laidlawi* (Fraser, 1924) © Baiju K; C – *Agriocnemis keralensis* Peters, 1981 © Vinayan P Nair; D – *Aciagrion approximans krishna* Fraser, 1921 © Kalesh Sadasivan; E – *Archibasis oscillans* (Selys, 1877) © Vinayan P Nair; F – *Mortanagrion varralli* Fraser, 1920 © Abraham Samuel; G – *Ischnura rubilio* Selys, 1876 © Kalesh Sadasivan; H – *Agriocnemis splendidissima* Laidlaw, 1919 © Baiju K

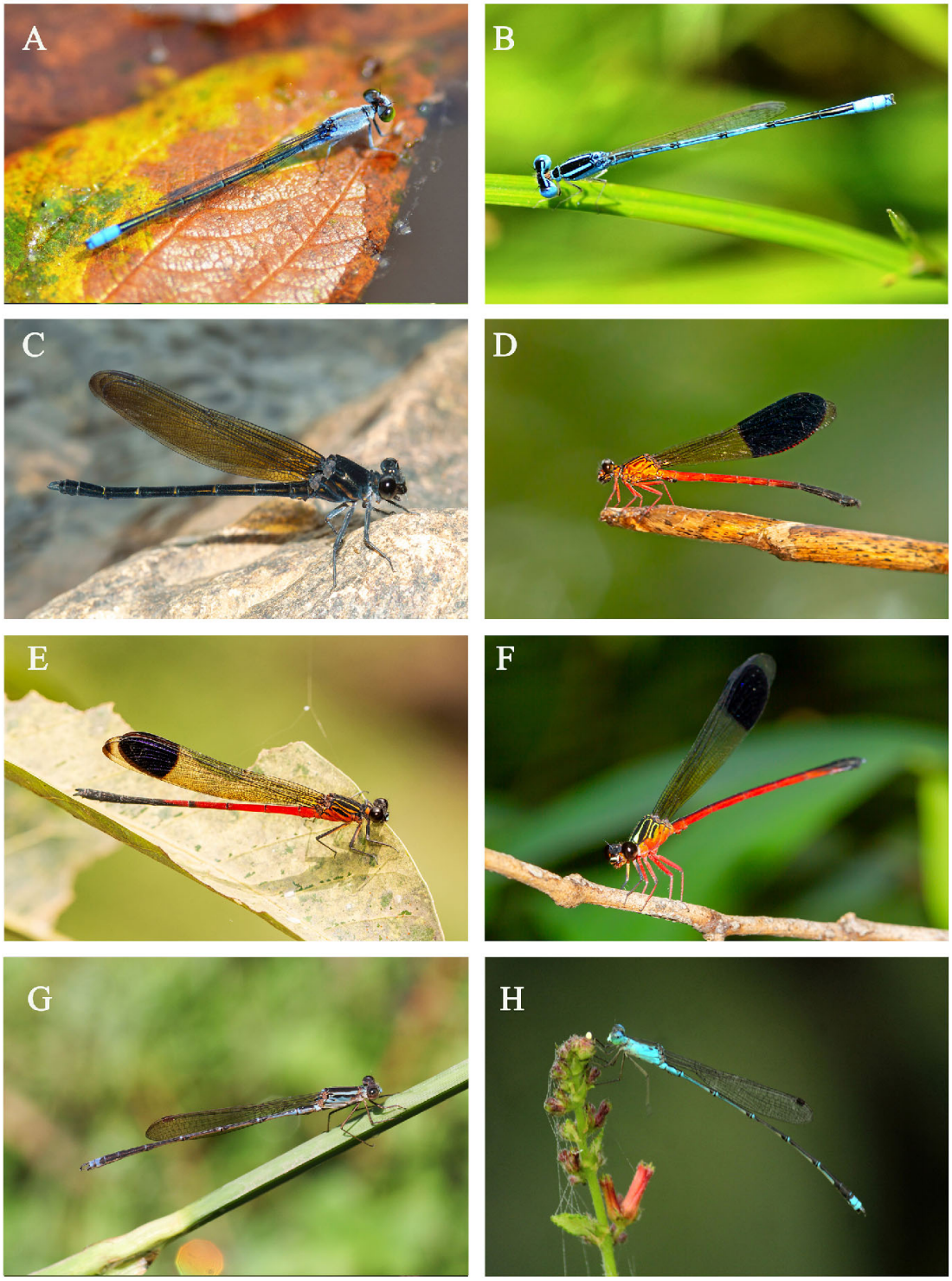

Fig. 8 A – *Paracercion calamorum* (Ris, 1916) © Vinayan P Nair; B – *Amphiallagma parvum* (Selys, 1876) © Vinayan P Nair; C – *Dysphaea ethela* Fraser, 1924 © Sunny Joseph; D – *Euphaea cardinalis* (Fraser, 1924) © Kalesh Sadasivan; E – *Euphaea dispar* (Rambur, 1842) © Kalesh Sadasivan; F – *Euphaea fraseri* (Laidlaw,1920) © Kalesh Sadasivan; G – *Indolestes gracilis davenporti* Fraser, 1930 © Abraham Samuel; H – *Indolestes pulcherrimus* © Muneer PK

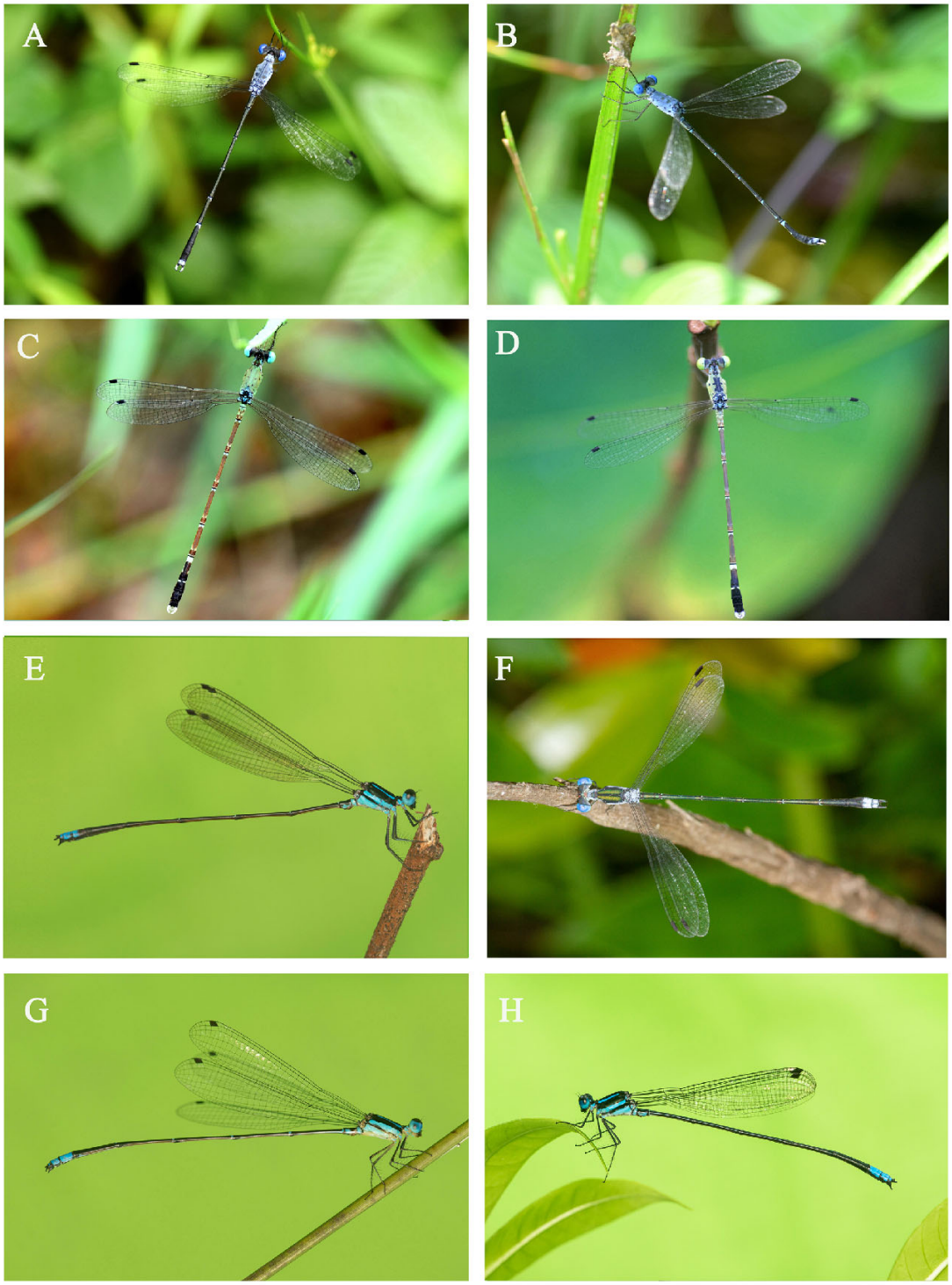

Fig. 9 A – *Lestes dorothea* Fraser, 1924 © Vinayan P Nair; B – *Lestes praemorsus decipiens* Kirby,1893 © Vinayan P Nair; C – *Platylestes platystylus* Rambur, 1842 © Vinayan P Nair; D – *Platylestes kirani* Emiliyamma, Palot & Charesh, 2020 © Vinayan P Nair; E – *Melanoneura bilineata* Fraser, 1922 © Kalesh Sadasivan; F – *Lestes malabaricus* Fraser 1929 © Kalesh Sadasivan; G – *Caconeura risi* (Fraser, 1931) © Kalesh Sadasivan; H – *Esme mudiensis* Fraser, 1931© Kalesh Sadasivan

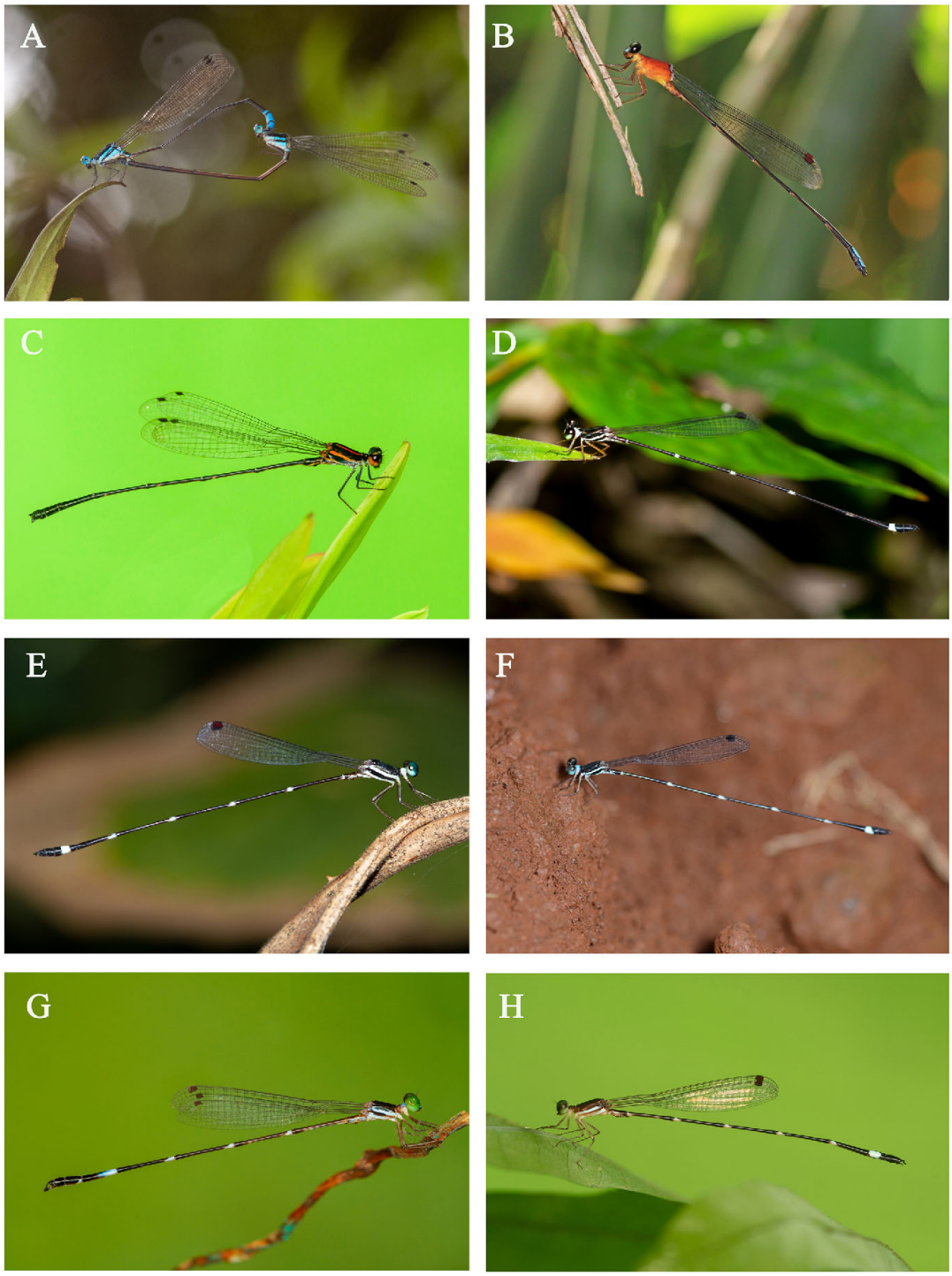

Fig. 10 A – *Phylloneura westermanni* (Hagen in Selys, 1860) © Kalesh Sadasivan; B – *Indosticta deccanensis* Laidlaw, 1915 © Abraham Samuel; C – *Prodasineura verticalis annandalei* (Fraser, 1921) © Kalesh Sadasivan; D – *Protosticta gravelyi* Laidlaw, 1915 © Kalesh Sadasivan; E – *Protosticta rufostigma* Kimmins 1958 © Kalesh Sadasivan; F – *Prorosticta mortonii* Fraser, 1924 © Manoj P; G – *Protosticta ponmudiensis* Kiran, Kalesh & Kunte, 2015 © Kalesh Sadasivan; H – *Protosticta sanguinostigma* Fraser, 1922 © Kalesh Sadasivan

Fig. 11 A – *Ceriagrion chromothorax* Joshi & Sawant, 2019 © Vinayan P Nair; B – *Ceriagrion rubiae* Laidlaw,1916 © Baiju K; C – *Pseudagrion indicum* Fraser, 1924 © Vinayan P Nair; D – *Pseudagrion rubriceps* (Selys,1876) © Kalesh Sadasivan; E – *Pseudagrion australasiae* Selys, 1876 © Abraham Samuel; F – *Elattoneura tetrica* (Laidlaw, 1917) © Vinayan P Nair; G – *Disparoneura apicalis* (Fraser, 1924) © Abraham Samuel; H – *Onychargia atrocyana* (Selys, 1865) © Abraham Samuel

(Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2014; KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014; Emiliyamma, 2005; KS), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalai landscapes (Emiliyamma and Radhakrishnan, 2002; VPN; KS). *Caconeura t–coerulea* (Fraser, 1933) is a WG endemic but not found in Kerala.

Genus *Copera* Kirby, 1890

Copera is represented by two species both in WG and Kerala. *Copera marginipes* (Rambur, 1842) is a common damsel found along ponds, puddles, canals, and streams. The cerci have only ¼ as long as paraprocts. It has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007), Palghat Hills (Emiliyamma *et al*., 2007; KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Anjanad Valley (Emiliyamma *et al*., 2007; Adarsh *et al*., 2015), High Range (KS), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and Coastal wetlands landscape (Emiliyamma, 2014; Raju, 2007; Roshnath, 2020). *Copera vittata deccanensis* Laidlaw, 1917 shares habitat with *C. marginipes*. The cerci are only half as long as paraprocts. It is reported from Coorg–Kannur landscape (Palot and Kiran, 2016; Nair, 2017), Wayanad (Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007), Palghat Hills (KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; KS), High Range (KS), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma *et al*., 2007; Emiliyamma, 2014; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetlands landscape (Raju, 2007; Emiliyamma, 2014; Roshnath, 2020). *Copera vittata deccanensis* is endemic to India.

Genus *Disparoneura* Selys, 1860

The genus is represented by two species in both WG and Kerala. *Disparoneura apicalis* (Fraser, 1924) is a rare endemic damsel of WG with a black thorax with brick red line, and black wing tips (Fig. 11G). It is a very rare damsel in WG and Kerala. In Kerala it has been reported only from Wayanad landscape (AS; MJP). *Disparoneura quadrimaculata* (Rambur, 1842) is another very rare damsel in WG and Kerala. It is endemic to India. It is a medium sized brick red damsel with black banded wing, found only in streams of north Kerala. It has been reported only from Coorg–Kannur landscape (Palot and Kiran, 2016) and Wayanad (MJP).

Genus *Elattoneura* Cowley, 1935

Elattoneura is represented by three species in WG but only two in Kerala. *Elattoneura souteri* (Fraser, 1924) is a beautiful and conspicuously colored insect that usually hides in shaded spots beneath overhanging bamboo, cane or bushes on the banks of submontane streams. Whole head, thorax and base of abdomen appear red in sunlight (Fraser, 1933). It has been reported from Coorg–Kannur (Vibhu V, per. com.), Wayanad (Fraser, 1933), Nelliampathies–Anamalais (KS), Pandalam Hills (KS) and Agasthyamalais landscape (KS). *Elattoneura tetrica* (Laidlaw, 1917) (Fig. 11F) is a shy retiring insect frequenting dark shady spots on sub-montane streams, mainly in thick forests. Although it closely resembles *E. niggerima* can be easily identified by its larger size and higher nodal index (Fraser, 1933). But as per Koparde *et al.* (2021) *E.niggerima* is significantly larger than *E.tetrica. Elattoneura tetrica* has been reported only from Coorg–Kannur (Nair, 2017; KS) and Agasthyamalais landscapes (KS). *Elattoneura niggerima* (Laidlaw, 1917) is an Indian endemic species present in WG and other parts of India but not reported from Kerala so far. *Elattoneura souteri* and *E. tetrica* are WG endemics.

Genus *Esme* Fraser, 1922

Esme includes three species endemic to WG and all are present in Kerala. They are moderate sized slender built damsels with complete anal bridge. *Esme cyaneovittata* Fraser, 1922 is confined to south of Palakkad Gap and can be distinguished from *E. mudiensis* (Fig. 9H) by its labrum marked with azure blue and from *E. longistyla* by its black legs unmarked with blue, very stout inferior anal appendages and broken blue lateral stripe on prothorax (Fraser, 1933). It is reported from Anjanad valley landscape (Fraser, 1933; KS; MJP), High Ranges (KS), Cardamom Hills (KS), and Pandalam Hills landscape (KS). *Esme longistyla* Fraser, 1931 is a rare insect and is considerably smaller than other *Esme* species. It has been reported from Wayanad landscape (KS), Nelliampathies–Anamalais (KS), High Ranges (KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS) and Agasthyamalai landscape (KS). *Esme mudiensis* Fraser, 1931 is a high altitude species and can be separated from other *Esme* species by labrum entirely unmarked with azure blue (Fraser, 1933). It is found at Wayanad landscape (Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Fraser, 1933, KS), Anjanad Valley (Adarsh *et al*., 2015; KS), High Ranges (Fraser 1931a; KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (KS) and Agasthyamalai landscapes (KS).

Genus *Melanoneura* Fraser, 1922

Melanoneura is a monotypic genus found both in WG and Kerala. These are moderately sized slender built damsels with the anal bridge entirely absent as in *Caconeura* but bigger in size and are represented by *M. bilineata* Fraser, 1922 (Fig. 9E). It is WG endemic and is included under near threatened category of IUCN Red List. It is always found along with *C. ramburi* but can be easily separated by the absence of conspicuous blue basal annules (Fraser, 1933). It has been reported from Coorg–Kannur landscape (MJP), Wayanad (Fraser, 1933; Palot and Emiliyamma, 2015; MJP), Nelliampathies–Anamalais (KS), Lower Periyar (KS), Pandalam Hills (KS) and Agasthyamalai landscape (KS).

Genus *Onychargia* Selys, 1865

Onychargia is another monotypic genus in WG and Kerala with a representative species *O. atrocyana* (Selys, 1865). It is a small glossy black damsel (Fig. 11H) found in forested marshlands. It has been reported from Coorg–Kannur landscape (Vibhu V., pers. com),Wayanad (Emiliyamma *et al*., 2007), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (KS), Lower Periyar (KS), Cardamom Hills (AS; KS), Pandalam Hills (KS) and Agasthyamalai landscape (KS). It is a migratory species (Fraser, 1933).

Genus *Phylloneura* Fraser, 1922

Phylloneura is another endemic monotypic genus found in WG and Kerala and is represented by *P. westermanni* (Selys, 1860). It is a slender built damsel (Fig. 10A) similar to *Caconeura* but differing in venation with higher network, high nodal index and complete anal bridge. The wings are longer, narrower, more pointed and falcate at the apex; azure blue markings are more extensive at terminal abdominal segments (Fraser, 1933). It is placed in the near threatened category of IUCN Red List. It has been reported from Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (Fraser, 1933; Palot and Emiliyamma, 2015; MJP), Nilgiri – Silent Valley (KS), Nelliampathies–Anamalais (KS), High ranges (KS), Lower Periyar (KS) and Cardamom Hills (KS) landscape.

Genus *Prodasineura* Cowley, 1934

Prodasineura is represented by a single species *P. verticalis annandalei* (Fraser, 1921) (Fig. 10C) in WG and Kerala and is an Indian endemic species. It is found in Coorg–Kannur landscape (Palot and Kiran, 2016; VPN; Nair, 2017), Wayanad (Emiliyamma *et al*., 2007; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Nelliampathies–Anamalais (Emiliyamma *et al*., 2007; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Anjanad Valley (Adarsh *et al*., 2015), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS)

and Agasthyamalai landscape (KS; Emiliyamma and Radhakrishnan, 2002).

Family Coenagrionidae Kirby, 1890

Coenagrionidae is the largest family of Zygoptera in WG and Kerala with nine genera *viz*., *Aciagrion* Selys, 1891, *Agriocnemis* Selys, 1877, *Amphiallagma* Kennedy, 1920, *Archibasis* Kirby, 1890, *Ceriagrion* Selys, 1876, *Ischnura* Charpentier, 1840, *Mortonagrion* Fraser, 1920, *Paracercion* Weeker & Dumont, 2004 and *Pseudagrion* Selys, 1876.

Genus *Aciagrion* Selys, 1891

Aciagrion is represented by three species in WG *viz*., *A. approximans krishna* Fraser,1921, *A. occidentale* Laidlaw, 1919 and *A. pallidum* Selys, 1891. The former two alone are found in Kerala. *Aciagrion approximans krishna* was previously considered as *A. hisopa* (Selys, 1876) but later Shantanu *et al.*(2016) reinstated it as *A. approximans krishna* (Fig. 7D) Subramanian and Babu (2017) considered *A. hisopa* as *species inquirenda.* It is a high altitude WG endemic species. It has been reported from Coorg–Kannur landscape (Palot and Kiran, 2016), Wayanad (Susanth and Anooj, 2020), Nigiri–Silent Valley (Emiliyamma *et al*., 2007), Nelliampathies–Anamalais (KS), Anjanad Valley (Adarsh *et al*., 2015; Sadasivan, 2018), High Ranges (KS), Lower Periyar (AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS) and Agasthyamalai landscape (KS). *Aciagrion occidentale* Laidlaw, 1919 is reported from Coorg–Kannur landscape (Emiliyamma *et al*., 2007; Palot and Kiran, 2016; Nair, 2017), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (KS), High range (KS), Lower Periyar (AS; KS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscape (Palot and Soniya, 2004; Radhakrishnan *et al*., 2006; Roshnath, 2020). This species shows local movement and migration (Fraser, 1933).

Genus *Agriocnemis* Selys, 1877

Agriocnemis is represented by five species viz., *A. femina* (Brauer, 1868), *A. keralensis* Peters, 1981, *A. pieris* Laidlaw, 1919, *A. pygmaea* (Rambur, 1842) and *A. splendidissima* Laidlaw, 1919 in WG, and all except *A. femina* are present in Kerala. *Agriocnemis keralensis* (Fig. 7C) is a WG endemic and was described from Kerala by Peters (1981) and a redescription was done by Nair and Subramanian (2014). Later it has been reported from Goa (Rangnekar *et al*., 2010) and Maharashtra (Koli *et al.,* 2021). It is found at Coorg–Kannur landscape (Nair 2017), Wayanad (Susanth and Anooj, 2020), Palghat Hills (KS), Nelliampathies–Anamalais (KS), Lower Periyar (Emiliyamma 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and Coastal Wetlands landscape (KS; Raju, 2007; Roshnath, 2020). *Agriocnemis pieris* was previously considered as an Indian endemic but as per Kalkman *et al.* (2020) it is also found in Bangladesh. It has been reported from Coorg–Kannur landscape (Emiliyamma, 2014Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; Susanth and Anooj, 2020), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007; KS), Palghat Hills (KS), Nelliampathies – Anamalais (Emiliyamma and Radhakrishnan, 2014; Adarsh *et al*., 2014; KS), Anjanad Valley (KS), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS; AS; VPN) and coastal wetlands landscape (Emiliyamma, 2014; Roshnath, 2020). *Agriocnemis pygmaea* has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005, Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al.,* 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2000; Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Anjanad Valley (Adarsh

et al., 2015), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma *et al*., 2007; Emiliyamma, 2014; KS), Pandalam Hills (KS), Agasthyamalais (Peters,1981; Emiliyamma and Radhakrishnan, 2002; KS), and coastal wetlands landscape (Palot and Soniya, 2004; Radhakrishnan *et al*., 2006; Raju, 2007; Emiliyamma, 2014; Roshnath, 2020). *Agriocnemis splendidissima* (Fig. 7H) has been reported from Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007), Nilgiri – Silent Valley (Emiliyamma *et al*., 2007; KS), Palghat Hills (KS), Nelliampathies–Anamalais (Emiliyamma *et al*., 2007; KS), Anjanad Valley (Sadasivan, 2018), High Range (KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS) and Agasthyamalais landscape (Emiliyamma and Radhakrishnan, 2002; KS).

Genus *Amphiallagma* Kennedy, 1920

Amphiallagma in WG and Kerala has a single species *A. parvum* (Selys, 1876) (Fig. 8B). It has been reported from Coorg–Kannur landscape (VPN) and Wayanad (KS).

Genus *Archibasis* Kirby, 1890

Archibasis is represented by *A. oscillans* (Selys, 1877) (Fig. 7E) and is found in Coorg–Kannur landscape (Nair, 2017; KS; VPN),Wayanad (Emiliyamma *et al*., 2007), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (KS; AS), Anjanad Valley (Sadasivan, 2018), High ranges (Kalesh, 2018), Lower Periyar (KS), Agasthyamalais (KS) and Coastal wetlands landscape (Raju, 2007; Roshnath, 2020).

Genus *Ceriagrion* Selys, 1876

According to Subramanian *et al*. (2018), four species of *Ceriagrion* were found in WG *viz., C. cerinorubellum* (Brauer, 1865), *C. coromandelianum* (Fabricius, 1798), *C. olivaceum* Laidlaw, 1914 and *C. rubiae* Laidlaw, 1916. *Ceriagron chromothorax* Joshi & Sawant (2019) (Fig. 11A) was later added to the WG list from Maharashtra (Joshi and Sawant, 2019). *Ceriagrion olivaceum aurantiacum* Fraser, 1924 is considered as a subspecies found in WG. Fraser (1924) described *C. aurantiacum* and synonymized it with *C. olivaceum* Laidlaw (Fraser, 1933) and explained it as a race of the former and named *C. olivaceum aurantiacum*. *Ceriagrion olivaceum aurantiacum* has been reported from Coorg–Kannur landscape (VPN), Wayanad (Fraser, 1924a) and Nilgiri – Silent Valley landscape (Rao & Lahiri, 1982). *Ceriagrion olivaceum olivaceum* Laidlaw, 1914, is found in Coorg–Kannur landscape (Nair, 2014; Palot and Kiran, 2016; VPN), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; Susanth and Anooj, 2020), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007) and Nelliampathies–Anamalais landscape (Gnanakumar *et al.,* 2012; KS). *Ceriagrion cerinorubellum* has been reported from Coorg– Kannur landscape (Nair, 2014; Palot and Kiran, 2016; Palot and Radhakrishnan, 2005), Wayanad (Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Anjanad Valley (Sharma *et al*., 2007; Adarsh *et al*., 2015), Lower Periyar (Emiliyamma, 2005; Varghese *et al*., 2014; AS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS; Peters, 1981; Emiliyamma and Radhakrishnan, 2002) and coastal wetlands landscape (Soniya, 2004; Radhakrishnan *et al*., 2006; Palot and Raju, 2007; Emiliyamma *et al*., 2007; Emiliyamma, 2014; Roshnath, 2020). *Ceriagrion chromothorax* Joshi & Sawant, 2019 is reported only from Coorg – Kannur landscape (VPN) and coastal wetlands so far (VPN). It is a WG endemic species and is supposed to be distributed north of Palakkad gap. *Ceriagrion coromandelianum* (Fabricius, 1798) is found in Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007; KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies – Anamalais (Emiliyamma *et al*., 2007; Gnanakumar *et al.,*2012;

Table 2. Systematic checklist of Odonates of Western Ghats and Kerala with their endemicity & IUCN status

Sl.No.	ODONATES	IUCN**
	SUBORDER ANISOPTERA	
	FAMILY AESHNIDAE	
1.	*Anaciaeschna jaspidea* (Burmeister, 1839)	LC
2.	*Anaciaeschna martini* Selys, 1897	LC
3.	*Anax ephippiger* (Burmeister, 1839)	LC
4.	*Anax guttatus* (Burmeister, 1839)	LC
5.	*Anax immaculifrons* (Rambur ,1842)	LC
6.	*Anax indicus* Lieftinck,1942	LC
7.	*Anax parthenope* (Selys ,1839)	LC
8.	*Gynacantha dravida* Lieftinck,1960	DD
9.	*Gynacantha khasiaca* MacLachlan,1896#	DD
10.	*Gynacantha millardi* Fraser,1920	LC
	FAMILY CHLOROGOMPHIDAE	
11.	*Chlorogomphus campioni* (Fraser, 1924)*	LC
12.	*Chlorogomphus xanthoptera* (Fraser, 1919) *	VL
	FAMILY CORDULIIDAE	
13.	*Hemicordulia asiatica* (Selys, 1878)	LC
	FAMILY GOMPHIDAE	
14.	*Acrogomphus fraseri* Laidlaw, 1925*	DD
15.	*Asiagomphus nilgiricus* Laidlaw, 1922*	DD
16.	*Burmagomphus cauvericus* Fraser, 1926*#	DD
17.	*Burmagomphus laidlawi* Fraser, 1924	DD
18.	*Burmagomphus pyramidalis* Laidlaw, 1922*	LC
19.	*Cyclogomphus flavoannulatus* Rangnekar, Dharwadkar, Kalesh & Subramanian, 2019*	NA
20.	*Cyclogomphus heterostylus* Selys,1854	DD
21.	*Cyclogomphus wilkinsi* Fraser, 1926 #	DD
22.	*Cyclogomphus ypsilon* Selys, 1854 #	NA
23.	*Davidioides martini* Fraser, 1924*	DD
24.	*Gomphidia fletcheri* Fraser, 1923* #	DD
25.	*Gomphidia kodaguensis* Fraser, 1923*	DD
26.	*Gomphidia platyceps* Fraser, 1953*#	NA
27.	*Gomphidia podhigai* Babu & Subramanian, 2019*#	NA
28.	*Gomphidia t-nigrum* Selys, 1854#	LC
29.	*Heliogomphus kalarensis* Fraser, 1934*	DD
30.	*Heliogomphus promelas* (Selys, 1873)	NT
31.	*Ictinogomphus rapax* (Rambur, 1842)	LC
32.	*Lamelligomphus nilgiriensis* (Fraser, 1922)*	LC
33.	*Macrogomphus annulatus annulatus* (Selys, 1854)#	DD
34.	*Macrogomphus wynaadicus* Fraser, 1924*	DD
35.	*Megalogomphus hannyngtoni* (Fraser, 1923)	NT
36.	*Megalogomphus superbus* Fraser, 1931*	DD
37.	*Melligomphus acinaces* (Laidlaw, 1922) *	DD
38.	*Merogomphus longistigma* (Fraser, 1922) *	DD
39.	*Merogomphus tamaracherriensis* Fraser, 1931*	NA
40.	*Microgomphus souteri* Fraser, 1924*	LC
41.	*Microgomphus torquatus* (Selys, 1854)*#	DD
42.	*Microgomphus verticalis* (Selys, 1873) *#	DD
43.	*Nychogomphus striatus* Fraser, 1924	DD
44.	*Onychogomphus malabarensis* (Fraser,1924) *	DD
45.	*Paragomphus lineatus* (Selys,1850)	LC
	FAMILY LIBELLULIDAE	
46.	*Acisoma panorpoides* Rambur, 1842	LC
47.	*Aethriamanta brevipennis* (Rambur, 1842)	LC
48.	*Brachydiplax chalybea* Brauer, 1868	LC
49.	*Brachydiplax sobrina* (Rambur,1842)	LC
50.	*Brachythemis contaminata* (Fabricius, 1793)	LC
51.	*Bradinopyga geminata* (Rambur, 1842)	LC
52.	*Bradinopyga konkanensis* Joshi & Sawant 2020*#	NA
53.	*Cratilla lineata calverti* (Forster,1903)	LC
54.	*Crocothemis erythraea* (Brulle´, 1832)	LC
55.	*Crocothemis servilia* (Drury,1770)	LC
56.	*Diplacodes lefebvrii* (Rambur,1842)	LC
57.	*Diplacodes nebulosa* (Fabricius, 1793)	LC
58.	*Diplacodes trivialis* (Rambur, 1842)	LC
59.	*Epithemis mariae* (Laidlaw, 1915) *	LC
60.	*Hydrobasileus croceus* (Brauer, 1867)	LC
61.	*Hylaeothemis apicalis* Fraser, 1924	DD
62.	*Indothemis carnatica* (Fabricius, 1798)	LC
63.	*Indothemis limbata sita* Campion, 1923	LC
64.	*Lathrecista asiatica* (Fabricius, 1798)	LC
65.	*Lyriothemis acigastra* (Selys, 1878)	DD
66.	*Lyriothemis tricolor* Ris, 1919	LC
67.	*Macrodiplax cora* (Kaup in Brauer, 1867)	LC
68.	*Neurothemis fulvia* (Drury, 1773)	LC
69.	*Neurothemis intermedia intermedia* (Rambur, 1842)	LC
70.	*Neurothemis tullia* (Drury, 1773)	LC
71.	*Onychothemis testacea ceylanica* Ris, 1912	LC
72.	*Orthetrum chrysis* (Selys, 1891)	LC

Sl.No.	ODONATES	IUCN**
73.	*Orthetrum coerulescens anceps* (Schneider,1845)#	LC
74.	*Orthetrum glaucum* (Brauer, 1865)	LC
75.	*Orthetrum luzonicum* (Brauer, 1868)	LC
76.	*Orthetrum pruinosum neglectum* (Rambur, 1842)	LC
77.	*Orthetrum sabina sabina* (Drury, 1770)	LC
78.	*Orthetrum taeniolatum* (Schneider, 1845)	LC
79.	*Orthetrum triangulare triangulare* (Selys, 1878)	LC
80.	*Pantala flavescens* (Fabricius, 1798)	LC
81.	*Paplopleura sexmaculata* (Fabricius, 1787)	NA
82.	*Potamarcha congener* (Rambur, 1842)	LC
83.	*Rhodothemis rufa* (Rambur, 1842)	LC
84.	*Rhyothemis triangularis* Kirby, 1889	LC
85.	*Rhyothemis variegata variegata* (Linnaeus, 1763)	LC
86.	*Sympetrum fonscolombi* (Selys, 1840)	LC
87.	*Sympetrum hypomelas* (Selys, 1884)#	LC
88.	*Tetrathemis platyptera* Selys, 1878	LC
89.	*Tholymis tillarga* (Fabricius, 1798)	LC
90.	*Tramea basilaris* (Palisot de Beauvois, 1805)	LC
91.	*Tramea limbata* (Desjardins, 1832)	LC
92.	*Tramea virginia* (Rambur, 1842)	LC
93.	*Trithemis aurora* (Burmeister,1839)	LC
94.	*Trithemis festiva* (Rambur, 1842)	LC
95.	*Trithemis kirbyi* Selys, 1891	LC
96.	*Trithemis pallidinervis* (Kirby, 1889)	LC
97.	*Urothemis signata* (Rambur, 1842)	LC
98.	*Zygonyx iris malabarica* Fraser, 1926	LC
99.	*Zygonyx torridus isis* Fraser, 1924	LC
100.	*Zyxomma petiolatum* Rambur, 1842	LC
	FAMILY MACROMIIDAE	
101.	*Epophthalmia frontalis binocellata* Fraser, 1936	LC
102.	*Epophthalmia vittata vittata* Burmeister, 1839	LC
103.	*Macromia annaimallaiensis* Fraser, 1931*	LC
104.	*Macromia bellicosa* Fraser, 1924*	LC
105.	*Macromia cingulata* Rambur, 1842	LC
106.	*Macromia ellisoni* Fraser, 1924*	LC
107.	*Macromia flavicincta* Selys, 1874	DD
108.	*Macromia flavocolorata* Fraser, 1922	LC
109.	*Macromia ida* Fraser, 1924*	LC
110.	*Macromia indica* Fraser, 1924*	DD
111.	*Macromia irata* Fraser, 1924*	LC
	GENERA INSERTAE SEDIS	
112.	*Idionyx corona* Fraser, 1921*	DD
113.	*Idionyx galeata* Fraser, 1924*	EN
114.	*Idionyx gomantakensis S*ubramanian, Rangnekar & Nayak, 2013*	NA
115.	*Idionyx minima* Fraser, 1931*	DD
116.	*Idionyx nadganiensis* Fraser, 1924*	DD
117.	*Idionyx nilgiriensis* (Fraser, 1918) *#	DD
118.	*Idionyx periyashola* Fraser, 1939*	DD
119.	*Idionyx rhinoceroides* Fraser, 1934*	LC
120.	*Idionyx saffronata* Fraser, 1924*	DD
121.	*Idionyx travancorensis* Fraser, 1931*	DD
122.	*Macromidia donaldi donaldi* (Fraser, 1924)*	LC
	SUBORDER ZYGOPTERA	
	FAMILY CALOPTERYGIDAE	
123.	*Neurobasis chinensis* (Linnaeus, 1758)	LC
124.	*Vestalis apicalis* Selys , 1873	LC
125.	*Vestalis gracilis* (Rambur, 1842)	LC
126.	*Vestalis submontana* Fraser, 1934	NA
	FAMILY CHLOROCYPHIDAE	
127.	*Calocypha laidlawi* (Fraser, 1924)*	DD
128.	*Heliocypha bisignata* (Hagen in Selys, 1853)	LC
129.	*Libellago indica* (Fraser, 1928)	LC
	FAMILY COENAGRIONIDAE	
130.	*Aciagrion approximans krishna* Fraser, 1921*	LC
131.	*Aciagrion occidentale* Laidlaw, 1919	LC
132.	*Aciagrion pallidum* Selys, 1891#	LC
133.	*Agriocnemis femina* (Brauer, 1868)#	LC
134.	*Agriocnemis keralensis* Peters, 1981*	LC
135.	*Agriocnemis pieris* Laidlaw, 1919	LC
136.	*Agriocnemis pygmaea* (Rambur, 1842)	LC
137.	*Agriocnemis splendidissima* Laidlaw, 1919	LC
138.	*Amphiallagma parvum* (Selys, 1876)	LC
139.	*Archibasis oscillans* (Selys, 1877)	LC
140.	*Ceriagrion cerinorubellum* (Brauer, 1865)	LC
141.	*Ceriagrion chromothorax* Joshi & Sawant, 2019*	NA
142.	*Ceriagrion coromandelianum* (Fabricius, 1798)	LC
143a.	*Ceriagrion olivaceum aurantiacum* Fraser, 1924	LC
143b.	*Ceriagrion olivaceum olivaceum* Laidlaw, 1914	LC
144.	*Ceriagrion rubiae* Laidlaw,1916	NA

Sl.No.	ODONATES	IUCN**	Sl.No.	ODONATES	IUCN**
145.	*Ischnura nursei* Morton, 1907#	LC	177.	*Caconeura ramburi* (Fraser, 1922)	DD
146.	*Ischnura rubilio* Selys, 1876	LC	178.	*Caconeura risi* (Fraser, 1931) *	DD
147.	*Ischnura senegalensis* (Rambur, 1842)	LC	179.	*Caconeura t-coerulea* (Fraser, 1933) *#	DD
148.	*Mortanagrion varralli* Fraser, 1920	DD	180.	*Copera marginipes* (Rambur, 1842)	LC
149.	*Paracercion calamorum* (Ris , 1916)	LC	181.	*Copera vittata deccanensis* Laidlaw, 1917	LC
150.	*Paracercion malayanum* Selys, 1876	LC	182.	*Disparoneura apicalis* (Fraser, 1924) *	VL
151.	*Pseudagrion australasiae* Selys, 1876	LC	183.	*Disparoneura quadrimaculata* (Rambur, 1842)	LC
152.	*Pseudagrion decorum* (Rambur, 1842)	LC	184.	*Elattoneura nigerrima* (Laidlaw, 1917)#	DD
153.	*Pseudagrion hypermelas* Selys, 1876#	LC	185.	*Elattoneura souteri* (Fraser, 1924) *	DD
154.	*Pseudagrion indicum* Fraser, 1924*	LC	186.	*Elattoneura tetrica* (Laidlaw, 1917) *	LC
155.	*Pseudagrion malabaricum* Fraser, 1924	LC	187.	*Esme cyaneovittata* Fraser, 1922*	DD
156.	*Pseudagrion microcephalum* (Rambur, 1872)	LC	188.	*Esme longistyla* Fraser, 1931*	LC
157.	*Pseudagrion rubriceps* (Selys, 1876)	LC	189.	*Esme mudiensis* Fraser, 1931*	DD
	FAMILY EUPHAEIDAE		190.	*Melanoneura bilineata* Fraser, 1922*	NT
158.	*Dysphaea ethela* Fraser, 1924	DD	191.	*Onychargia atrocyana* (Selys, 1865)	LC
159.	*Euphaea cardinalis* (Fraser, 1924) *	LC	192.	*Phylloneura westermanni* (Hagen in Selys, 1860) *	NT
160.	*Euphaea dispar* (Rambur, 1842) *	LC	193.	*Prodasineura verticalis annandalei* (Fraser, 1921)	LC
161.	*Euphaea fraseri* (Laidlaw,1920) *	LC	194.	*Pseudocopera ciliata* (Selys, 1863)#	LC
162.	*Euphaea pseudodispar* Sadasivan & Bhakare, 2021*#	NA		**FAMILY PLATYSTICTIDAE**	
163.	*Euphaea thosegharensis* Sadasivan & Bhakare, 2021*#	NA	195.	*Indosticta deccanensis* Laidlaw, 1915*	VL
	FAMILY LESTIDAE		196.	*Protosticta antelopoides* Fraser, 1931*	DD
164.	*Indolestes gracilis davenporti* Fraser, 1930*	LC	197.	*Protosticta cyanofemora* Joshi, Subramanian, Babu & Kunte 2020*	NA
165.	*Indolestes pulcherrimus* Fraser, 1924*	DD	198.	*Protosticta davenporti* Fraser, 1931*	LC
166.	*Lestes concinnus* Hagen in Selys, 1862	DD	199.	*Protosticta gravelyi* Laidlaw, 1915*	LC
167.	*Lestes dorothea* Fraser, 1924	LC	200.	*Protosticta hearseyi* Fraser, 1922*	DD
168.	*Lestes elatus* Hagen in Selys, 1862	LC	201.	*Protosticta monticola* Emiliyamma & Palot, 2016*	DD
169.	*Lestes malabaricus* Fraser 1929	DD	202.	*Prorosticta mortonii* Fraser, 1924*	LC
170.	*Lestes nodalis* Selys, 1891	LC	203.	*Protosticta myristicaensis*Joshi & Kunte,2020*#	NA
171.	*Lestes patricia* Fraser, 1924*	NA	204.	*Protosticta ponmudiensis* Kiran, Kalesh & Kunte, 2015*	DD
172.	*Lestes praemorsus decipiens* Kirby,1893	LC	205.	*Protosticta rufostigma* Kimmins 1958*	DD
173.	*Lestes viridulus* Rambur, 1842#	LC	206.	*Protosticta sanguinostigma* Fraser, 1922*	VL
174.	*Platylestes kirani* Emiliyamma, Palot & Charesh 2020*	NA	207.	*Protosticta sholai* Subramanian & Babu, 2020*	NA
175.	*Platylestes platystylus* Rambur, 1842	LC			
	FAMILY PLATYCNEMIDIDAE				
176.	*Caconeura gomphoides* (Rambur, 1842)*	DD			

* Endemic to Western Ghats; # not reported from Kerala

**DD–Data Deficient, NA–Not assessed, LC–Least Concern, EN–Endangered, VL–Vulnerable, NT–Near Threatened

Adarsh *et al*., 2014; KS), Anjanad Valley (Sharma *et al*., 2007; Adarsh *et al.,* 2015), Lower Periyar (Emiliyamma, 2005; AS ; Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (Peters 1981; Emiliyamma and Radhakrishnan 2002, KS) and coastal wetlands landscape (Palot and Soniya, 2004; Radhakrishnan *et al*., 2006; Raju, 2007; Emiliyamma, 2014; Roshnath, 2020). *Ceriagrion rubiae* Laidlaw, 1916 (Fig. 11B) is found in Coorg – Kannur landscape (VPN; Emiliyamma, 2014; Nair, 2014; Palot and Kiran, 2016), Wayanad (KS), Nilgiri–Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Emiliyamma *et al*., 2007; Adarsh *et al.,* 2014; KS), Lower Periyar (Varghese *et al*., 2014), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS) and coastal wetlands (Roshnath, 2020).

Genus *Ischnura* Charpentier, 1840

Ischnura in WG is represented by three species viz., *Ischnura rubilio* Selys, 1876, *Ischnura senegalensis* (Rambur, 1842) and *Ischnura nursei* Morton, 1907. In Kerala, only the former two species are found. *Ischnura rubilio* Selys, 1876 (Fig. 7G) has been reported from Coorg – Kannur landscape (Palot and Radhakrishnan, 2005; Nair, 2014; Palot and Kiran, 2016), Wayanad (Emiliyamma *et al*., 2007; Palot and Emiliyamma, 2015; MJP; Susanth and Anooj, 2020), Nilgiri– Silent Valley (Emiliyamma *et al*., 2007; KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies – Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Anjanad Valley (Sharma *et al*., 2007; Adarsh *et al*., 2015; Sadasivan, 2018; KS), High Ranges (Sadasivan, 2018; KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (Emiliyamma, 2014; KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and Coastal Wetland landscapes (Palot and Soniya, 2004; Radhakrishnan *et al*., 2006; Raju, 2007; Emiliyamma, 2014; Roshnath, 2020). *Ischnura senegalensis* (Rambur, 1842) has been reported from Coorg–Kannur landscape (Palot and Kiran, 2016; Nair, 2017), Wayanad (Palot and Emiliyamma, 2015), Nilgiri – Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007), Nelliampathies –Anamalais (KS), High Ranges (KS), Lower Periyar (KS; AS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetland landscapes (Palot and Soniya, 2004; Raju, 2007; Emiliyamma, 2014; Roshnath, 2020). This species is migratory (Fraser, 1933).

Genus *Mortonagrion* Fraser, 1920

Mortonagrion is found both in WG and Kerala. The representative species, *M. varalli* Fraser, 1920 (Fig. 7F), has been reported from Coorg–Kannur landscape (VPN; Emiliyamma, 2014), Wayanad (Emiliyamma *et al*., 2007), Nilgiri–Silent Valley (Emiliyamma, 2014), Lower Periyar (KS; Varghese *et al*., 2014), Pandalam Hills (KS), Agasthyamalais (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetlands landscape (Palot and Soniya, 2004; Radhakrishnan *et al*., 2006; Raju, 2007; Emiliyamma, 2014; Roshnath, 2020).

Genus *Paracercion* Weeker & Dumont, 2004

Paracercion is represented by two species in both WG and Kerala viz., *P. calamorum* (Ris, 1916) and *P. malayanum* Selys, 1876 and *P. calamorum* (Fig. 8A) is found in Coorg–Kannur landscape (Nair 2017), Nelliampathies–Anamalais (AS; KS), Lower Periyar (AS), Pandalam Hills (KS) and coastal wetlands landscapes (KS). Subramanian *et al.* (2020) omitted *P.malayanum* in the WG list of odonates. *Paracercion malayanum* is found in Agasthyamalais landscape only (Bo Nielson, per. com.).

Genus *Pseudagrion* Selys, 1876

Pseudagrion Selys, 1876 includes small slender built non–metallic colored damsels with bright blue marked with black, red, orange, or green or it may be dull colored, black, brown or pruinosed (Fraser, 1933). It is represented by seven species in WG viz., *P. australasiae* Selys, 1876, *P. decorum* (Rambur, 1842), *P. hypermelas* Selys, 1876, *P. indicum* Fraser, 1924, *P. malabaricum* Fraser

1924, *P. microcephalum* (Rambur, 1872) and *P. rubriceps* (Selys, 1876). Except *P. hypermelas,* all other species are found in Kerala. *Pseudagrion* species identification is based on anal appendages and cannot be done based on prothoracic markings. *Pseudagrion australasiae* (Fig. 11E) has an entire blue abdominal segment 8 and 9 with an apical fringe of black spines of which on eighth it appears as black ring and cerci shorter than segment 10 and bifid at apex. Subramanian *et al.* (2020) has not included *P. australasiae* in WG odonata list. It is found in Coorg–Kannur (VPN), Nelliampathies–Anamalais (AS), Lower Periyar (KS), Cardamom Hills (KS) and Pandalam Hills landscapes (KS). *Pseudagrion decorum* is found in Coorg–Kannur landscape (Nair 2017), Wayanad (KS) Palghat Hills (KS), Nelliampathies–Anamalais (KS), Anjanad Valley (KS), Lower Periyar (KS), Cardamom Hills (Emiliyamma *et al*., 2007; KS), Pandalam Hills (KS), Agasthyamalais (KS) and coastal wetlands (Roshnath, 2020). It is a migratory species (Fraser, 1933). *Pseudagrion indicum* (Fig. 11C) is found in Coorg–Kannur landscape (Palot and Kiran, 2016; Nair, 2017), Wayanad (Palot and Emiliyamma, 2015; Emiliyamma *et al* 2007, Susanth and Anooj, 2020), Nilgiri – Silent Valley (KS), Palghat Hills (KS), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan 2014, KS), Anjanad Valley (KS), High Range (KS), Lower Periyar (Varghese *et al*., 2014; AS; KS), Cardamom Hills (KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS), Agasthyamalais (KS) and coastal wetlands (Roshnath, 2020). *Pseudagrion malabaricum* has an entire blue abdominal segment 8 and 9 with an apical fringe of black spines of which on eighth it appears as black ring and cerci shorter than segment 10 and not bifid at the apex which curl strongly inward as a robust tooth. It has been reported from Coorg–Kannur landscape (Nair, 2014), Wayanad (VPN; Susanth and Anooj, 2020), Nilgiri–Silent Valley (Emiliyamma *et al*., 2007), Palghat Hills (VPN), Nelliampathies–Anamalais (KS), Lower Periyar (KS), Cardamom Hills (Emiliyamma, 2014; KS), Pandalam Hills (Pradeepkumar *et al*., 2014; KS) and Agasthyamalais landscape (Emiliyamma and Radhakrishnan, 2002; KS). *Pseudagrion microcephalum* has abdominal segments 8 and 9 blue with apical fringe of black spines and the eighth apical dorsal ring is thick and cerci is as long as segment 10, narrow at base, deeply cupped within and bifid at apex. It is found in Coorg–Kannur landscape (Nair, 2017; Palot and Kiran, 2016; Palot and Radhakrishnan, 2005, Emiliyamma, 2014), Wayanad (Palot and Emiliyamma, 2015; MJP), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Gnanakumar *et al.,* 2012; Adarsh *et al*., 2014; KS), Anjanad Valley (Emiliyamma *et al*., 2007; Adarsh *et al*., 2015), High Range (KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma, 2014; KS), Pandalam Hills (KS), Agasthyamalais landscape (KS) and Coastal wetlands landscape (Palot and Soniya, 2004; Radhakrishnan *et al*., 2006; Raju, 2007; Emiliyamma, 2014; Roshnath, 2020). It is migratory (Fraser, 1933). *Pseudagrion rubriceps* (Fig. 11D) is found in Coorg–Kannur landscape (Palot and Radhakrishnan, 2005; Palot and Kiran, 2016; Nair, 2017), Wayanad (MJP; Susanth and Anooj, 2020), Nilgiri–Silent Valley (KS), Palghat Hills (Emiliyamma *et al*., 2007; KS), Palghat plains (Palot *et al*., 2005), Nelliampathies–Anamalais (Emiliyamma and Radhakrishnan, 2014; Gnanakumar *et al.*, 2012; Adarsh *et al* 2014; KS), Anjanad Valley (Emiliyamma *et al*., 2007; Adarsh *et al*., 2015; Sharma *et al*., 2007), High ranges (Kalesh, 2018; KS), Lower Periyar (Varghese *et al*., 2014; AS), Cardamom Hills (Emiliyamma, 2014; KS), Pandalam Hills (KS), Agasthyamalais landscape (Emiliyamma and Radhakrishnan, 2002; KS) and coastal wetlands landscape (Roshnath, 2020).

DISCUSSION

Endemism:

Kalkman *et al.* (2020) found 73 endemic species in WG. Subramanian *et al.,* 2020 stated that the number of endemic species in WG is 84. Within family Aeshnidae, Kalkman *et al.* (2020) mentioned only *G. rotundata* endemic to India. *Gynacantha rotundata* Navas, 1930 is only known from its type description. Kalkman *et al.* (2020) considered it as

identical to *G. dravida* but Subramanian *et al*. (2020) mentioned it as endemic to WG. Since *G. rotundata* is not treated as a separate species, it is not included as a WG endemic and hence Aeshnidae have no endemic member in WG and Kerala. Among Gomphidae, Kalkman *et al*. (2020) mentioned 24 endemic species in WG, while Subramanian *et al.* (2020) reported 26 endemic Gomphids in WG. *Lamelligomphus nilgiriensis* Fraser, 1922 is found both in WG and Kerala and is endemic to WG. Two subspecies of *Lamelligomphus viz. L. n. nilgiriensis* (Fraser, 1922) and *L. n. annamallaicus* Fraser, 1934 are found. According to Fraser (1934) the race *annamallaicus* is found south of Palghat gap and the type locality is Mudis hills, south India. Specimens from Coorg and Nilgiris belong to race *nilgiriensis* and hence the specimens found north of Palghat gap are race *nilgiriensis*. As per Kalkman *et al*. (2020) *L. n. nilgiriensis* is endemic to WG and *L. n. annamallaicus* is endemic to India. However both races are endemic to WG. *Burmagomphus laidlawi* is considered endemic to India and *B. pyramidalis* as WG endemic by Kalkman *et al*. (2020). Nonetheless, Subramanian *et al.* (2020) considered both as WG endemics. *Heliogomphus promelas* (Selys, 1873) was historically considered endemic to WG (Babu *et al*., 2013), however, according to Subramanian *et al*. (2018, 2020) and Kalkman *et al.* (2020) the taxon is considered endemic to the wider Indian region. Dawn (2021) recently reported certain taxa from West Bengal, previously thought to be endemic to WG. This removes *Cyclogomphus wilkinsi* Fraser, 1926 and *C. ypsilon* Selys, 1854 from their WG endemic status. Thus, only one species *C. flavoannulatus* is endemic to WG. In summary there are 21 endemic species of Gomphidae in WG and 15 endemic species in Kerala. Chlorogomphidae includes two endemic species and Macromiidae has six endemics both in WG and Kerala. Corduliidae lacks any endemic species in WG or Kerala. Libellulidae has two endemic species in WG and only one in Kerala. As per Kalkman *et al*. (2020) *Bradinopyga konkanensis* is endemic to India. Subramanian *et al.* (2020) mentioned it as endemic to WG and is followed regarding endemicity of *B. konkanensis*. *Bradinopyga konkanensis* has not been authentically reported from Kerala. The genera *Macromidia* Martin, 1907 and *Idionyx* Hagen, 1867 (Genera *Incertae sedis*) have 11 species endemic to WG, of which 10 are found in Kerala. Among Lestiidae Subramanian *et al.* (2020) mentioned four WG endemic species. There are reports of the occurrence of *Lestes patricia* in Jammu and Kashmir and Pakistan which have to be confirmed (Kalkman *et al*., 2020). Family Platystictidae of WG has 13 endemic species (Subramanian *et al.,* 2020) of which Kerala has 12. As per Kalkman *et al.* (2020) *Protosticta hearseyi* Fraser, 1922 is also reported from Pakistan. However, it needs to be reconfirmed and therefore here it is considered as WG endemic. Family Calopterygidae does not have any WG endemic species where as Chlorocyphidae have one endemic species in WG and Kerala. Euphaeidae have five endemic species in WG but three in Kerala. Platycnemididae has 11 endemic species in WG but only 10 are found in Kerala. Family Coenagrionidae has four endemic species both in WG and Kerala. *Mortonagrion varalli* is considered as endemic to WG (Subramanian *et al.,* 2020) but as per Kalkman *et al.* (2020) it is also found in Bangladesh. Thus the WG harbours 80 endemic species of odonates of which Kerala has 68 species (See Table 2 for the list of endemic species).

***IUCN Status*:**

As per the IUCN (2021) Red List assessment one species, *Idionyx galeata* is categorized endangered and four species *viz., Heliogomphus promelas, Megalogomphus hannyngtoni, Melanoneura bilineata* and *Phylloneura westermanni* categorized near threatened and four species– *Chlorogomphus xanthoptera, Disparoneura apicalis, Indosticta deccanensis* and *Protosticta sanguinostigma* as vulnerable. Apart from above, 130 species of Odonata in WG belong to least concern status and 50 species to the data deficient categories. The status of 18 odonates has not been assessed so far (See Table 2 for the list of IUCN status of species).

In conclusion, we recognize 181 species belonging to 87 genera and 14 families of Odonata for Kerala, including 68 endemics. Studies on odonates of the Western Ghats have been meagre compared to vertebrate groups. There are many species that have been described in the times of FC Fraser in the first half of 1900's, but never found after the initial records. This means that there is a dearth of serious scientific works from the region. This paper provides an updated checklist of odonates of WG and Kerala and also enlists endemic species and those in IUCN Red List categories. Interestingly, none of the species is listed in Indian Wildlife (Protection) Act of 1972. The present study will open the way for more systematic assessment of odonates.

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REFERENCES

Adarsh C.K., Aneesh K.S. and Nameer P.O. (2014) A preliminary checklist of Odonates in Kerala Agricultural University (KAU) campus, Thrissur District, Kerala, Southern India. Journal of Threatened Taxa 6 (8): 6127–6137. http://dx.doi.org/ 10.11609/jott.o3491.6127-37.

Adarsh C.K., Arunraj R. and Nameer P.O. (2015) Odonata (Insecta) diversity of Chinnar Wildlife Sanctuary, The Southern Western Ghats, India. Journal of Threatened Taxa 7 (2): 6910–6919. http://dx.doi.org/10.11609/JoTT.o3771.6010-19.

Anderson C.R. (2009) Do dragonflies migrate across the western Indian ocean? Journal of Tropical Ecology 25: 347–358. doi: 10.1017/S0266467409006087.

Arunima J. and Nameer P.O. (2021) A preliminary checklist of dragonflies and damselflies (Insecta: Odonata) of Vakkom Grama Panchayath, Thiruvananthapuram District, Kerala, India. Journal of Threatened Taxa 13(8): 19125–19136. https://doi.org/10.11609/jott.7311.13.8.19125 -19136.

Babu R., Subramanian K.A. and Nandy S. (2013) Endemic odonates of India. Records of the Zoological Survey of India, Occasional Paper No. 347: 1–60.

Babu R. and Subramanian K.A. (2019) A new species of *Gomphidia* Selys, 1854 (Insecta: Odonata: Anisoptera: Gomphidae) from the Western Ghats of India. Zootaxa 4652 (1): 155–164. https://doi.org/10.11646/zootaxa.4652.1.9

Bhakare, S.D., Nair, V.P. Pawar, P.A. Bhoite, S.H. and Sadasivan, K. (2021) Two new species of *Euphaea* Selys, 1840 (Odonata: Zygoptera: Euphaeidae) from northern Western Ghats, India. Journal of Threatened Taxa 13 (5): 18200–18214. doi.org/10.11609/jott.6579.13.5.18200– 18214.

Bose, C.N., Binoy, C.F. and Kakkassery, F. (2021) On the diversity and abundance of riparian odonate fauna (Insecta) of the midstream Chalakkudy river, Kerala, India . Journal of Threatened Taxa 13 (8): 19053-19059. https://doi.org/10.11609/jott.7328.13.8.190053 -19059.

Coniff K., Sasamoto A., Futahasi R. and Singh M.L. (2019) Revision of the status of *Anaciaeschna donaldi* and *A.martini,* with allied species and distributional notes (Odonata: Aeshnidae). Odonatologica 48(3/4): 265–284. http://doi.org/10.5281/zenodo. 3539740.

Das K.S.A., Subramanian K.A., Emiliyamma K.G., Palot M.J. and Nishad K.A. (2013) Range extension and larval habitat of *Lyriothemis tricolor* Ris, 1919 (Odonata: Anisoptera : Libellulidae) from Southern Western Ghats, India. Journal of Threatened Taxa 5 (17): 5237–5246. http://dx.doi.org/10.11609/JoTT.o3716.5237-46.

Dawn P. (2021) Dragonflies and damselflies (Insecta: Odonata) of West Bengal, an annotated list of species. Oriental Insects. doi.org/10. 1080/00305316.2021.1908188.

Emiliyamma K.G. (2005) On the Odonata (Insecta) fauna of Kottayam district, Kerala, India. Zoos Print Journal 20 (12): 2108–2110.

Emiliyamma K.G. (2014) Systematic studies on Odonata (Insecta) of Southern Western Ghats. Records of the Zoological Survey of India 114 (1): 57–87.

Emiliyamma K.G. and Palot M.J. (2016 a) Range extension of *Lestes nodalis* Selys, 1891 (Odonata: Zygoptera: Lestidae) in Southern India. Journal of Threatened Taxa 8 (2): 8528 – 8530. http://dx.doi.org/10.11609/jott.2573.8.2.8528 - 8530.

Emiliyamma K.G. and Palot M.J. (2016 b) A new species of *Protosticta* Selys, 1885 (Odonata: Zygoptera: Platystictidae) from Western Ghats, Kerala, India. Journal of Threatened Taxa 8(14): 9648– 9652. http://dx.doi.org/10.11609/jott.3226.8.14.9648 - 9652.

Emiliyamma K.G. and Radhakrishnan C. (2000) Odonata (Insecta) of Parambikulam Wildlife Sanctuary, Kerala, India. Records of the Zoological Survey of India 98 (1): 157–167.

Emiliyamma K.G. and Radhakrishnan C. (2014) Additional records of Odonata (Insecta) from Parambikulam Wildlife Sanctuary, Kerala, India. Records of the Zoological Survey of India 114 (3):365–369.

Emiliyamma K.G. and Radhakrishnan C. (2002) Addition to the Odonata (Insecta) of Thiruvananthapuram District, Kerala. Zoos Print Journal 17 (10): 914–917.

Emiliyamma K.G. and Radhakrishnan C. (2006) First report of *Cyclogomphus heterostylus* Selys (Odonata: Insecta) from Kerala, South India. Records of the Zoological Survey of India 106 (2): 123–124.

Emiliyamma K.G., Radhakrishnan C. and Palot M.J. (2007) Odonata (Insecta) of Kerala. Records of the Zoological Survey of India, Occ. Paper No. 269. 195 pp + 8 plates.

Emiliyamma K.G., Palot M.J. and Radhakrishnan C. (2012) *Microgomphus souteri* Fraser, a new addition to the Odonata (Insecta) fauna of Kerala, southern India. Journal of Threatened Taxa 4 (6): 2667–2669.

Emiliyamma K.G., Palot M.J., Radhakrishnan C. and Balakrishnan V.C. (2013) *Lyriothemis acigastra*: A new addition to the Odonata fauna of Peninsular India. Taprobanica 5(1): 73 –74.

Emiliyamma K.G., Palot M.J. and Charesh C. (2020) A new species of *Platylestes* Selys (Odonata: Zygoptera: Lestidae) from the coastal area of Kannur District, Kerala, India. Journal of Threatened Taxa 12 (13): 16854-16860. https://doi.org/ 10.11609/jott.5209.12.13.16854 -16860.

Fraser F.C. (1924a) A survey of the Odonata fauna of western India with special remarks on the genera *Macromia* and *Idionyx* and description of thirty new species. Records of the Indian Museum 26 (5): 423–522, pls. 25–27 excl.

Fraser F.C. (1924b) Indian Dragonflies, part XVIII. Journal of the Bombay Natural History Society 29: 982–1006, pls. 1–2 excl.

Fraser F.C. (1931) Addition to the survey of the Odonata (dragonfly) fauna of Western India, with descriptions of nine new species. Records of the Indian Museum 33: 443–474.

Fraser F.C. (1933) Fauna of British India, including Ceylon and Burma. Odonata, Vol I. Taylor & Francis group, London. 423pp.

Fraser F.C. (1934) Fauna of British India, including Ceylon and Burma. Odonata, Vol II. Taylor & Francis group, London. 398pp.

Fraser F.C.(1936) Fauna of British India, including Ceylon and Burma. Odonata, Vol III. Taylor & Francis group, London. 461pp.

Garrison R.W., von Ellenrieder N. and Louton J.A. (2006) Dragonfly genera of the New World: an illustrated and annotated key to the Anisoptera. The Johns Hopkins University Press, Baltimore, Maryland, USA, 368pp.

Garrison, R.W., von Ellenrieder, N. and Louton, J.A. (2010) Damselfly genera of the New World : an illustrated and annotated key to the Zygoptera. The Johns Hopkins University Press, Baltimore, Maryland, USA. 490 pp.

Gnanakumar M., Ansil B.R., Nameer P.O. and Das S. (2012) Checklist of Odonates of Chimmony Wildlife Sanctuary. Malabar Trogon 10 (1&2): 5–8.

Hamalainen A. (2011) Notes on the taxonomic status of *Vestalis submontana* Fraser, 1934 from South India (Zygoptera: Calopterygidae). Notulae odonatologicae 7 (8): 69–76.

Haneef M., Crasta B.R.S. and Chandran A.V. (2021) Report of *Bradinopyga konkanensis* Joshi & Sawant, 2020 (Insecta : Odonata) from Kerala, India. Journal of Threatened Taxa 13 (8): 19173-19176. https://doi.org/10.11609/jott.6484.13.8. 19173 - 19176.

IUCN (2021) The IUCN Red List of Threatened Species. Version 2021-1. https://www.iucnredlist.org. Downloaded on 03 June 2021.

Jose J. (2016) A checklist of Odonates of Kadavoor village, Ernakulam district, Kerala. Malabar Trogon 14 (1–3): 21–22.

Joshi S. and Sawant D. (2019) *Ceriagrion chromothorax sp. nov* (Odonata: Zygoptera: Coenagrionidae) from Sindhudurg, Maharashtra, India. Journal of Threatened Taxa 11 (7): 13875–13885. https://doi.org/10.11609/jott.4753.11.7.13875 -13885.

Joshi S. and Sawant D. (2020) Description of *Bradinopyga konkanensis sp. nov.* (Odonata: Anisoptera: Libellulidae) from the coastal region of Maharashtra, India. Zootaxa 4779 (1): 65–78. https://doi.org/10.11646/zootaxa.4779.1.4.

Joshi S., Subramanian K.A., Babu R., Sawant D. and Kunte K. (2020) Three new species of *Protosticta* Selys, 1885 (Odonata: Zygoptera: Platystictidae) from the Western Ghats, India, with taxonomic notes on *P.mortoni* Fraser, 1922 and rediscovery of *P.rufostigma* Kimmins, 1958. Zootaxa 4858 (2): 151–185. https://doi.org/10.11646/zootaxa.4858.2.1.

Kalkman V.J., Babu R., Bedjanic M., Coniff K., Gyeltshen T., Khan M.K., Subramanian K.A., Zia A. and Orr A.G. (2020) Checklist of the dragonflies and damselflies (Insecta: Odonata) of Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka. Zootaxa 4849 (1): 1–84. https://doi.org/10.11646/zootaxa.4849.1.1.

Kiran C.G., Kalesh S. and Kunte K. (2015) A new species of damselfly, *Protosticta ponmudiensis* (Odonata; Zygoptera: Platystictidae) from Ponmudi Hills in the Western Ghats of India. Journal of Threatened Taxa 7 (5): 7146–7151. http://dx.doi.org/10.11609/JoTT.o4145.7146 - 51.

Kiran C.G. and Raju D.V. (2011) Checklist of Odonata of Kerala with their Malayalam names. Malabar Trogon 9 (3): 31 –35.

Kiran C.G. and Raju D.V. (2013) Dragonflies and Damselflies of Kerala. A bilingual photographic field guide. Tropical Institute of Ecological Sciences, Kottayam, Kerala. 156pp.

Koli Y., Dalvi A. and Sawant D. (2021) New records of *Agriocnemis keralensis* Peters, 1981 and *Gynacantha khasiaca* MacLachlan, 1896 (Insecta: Odonata) from Maharashtra, India. Journal of Threatened Taxa 13 (7): 18908-18919. http://dx.doi.org/10.11609/jott.6801.13.7. 18908 - 18919.

Koparde P., Halali S. Tiple A., Ranganekar P., Sonawane A., Payra A., Dawn P., Raju A. and Subramanian K.A. (2021) Lost in Time : Redescription and ecological re -assessment of two Indian endemic *Elattoneura* Cowley, 1935 (Platycnemididae) damselflies. International Journal of Odonatology 24: 82–94. https://doi.org/10.23797/2159-6719_24_6.

Mathavan S. and Miller P.L. (1989) A collection of dragonflies (Odonata) made in the Periyar National Park, Kerala, South India, in January 1988. International Odonatological Society, Bilthoven (Rapid communications, supplements), no.10, 10pp.

Nair V.P. (2014) Odonata (Insecta) fauna of Varadoor, Kannur, Kerala, South India. Bugs R All 21: 6–10.

Nair M.V. and Subramanian K.A. (2014) A new species of *Agriocnemis* Selys, 1869 (Zygoptera: Coenagrionidae) from Eastern India with redescription of *Agriocnemis keralensis* Peter, 1981. Records of the Zoological Survey of India 114 (4): 669– 679.

Nair V.P. (2017) Dragonflies: Additions to the Odonata (Insecta) fauna of Varadoor, Kannur, Kerala, South India. Bugs R All 164. Zoos Print 32(11): 24–30.

Palot M.J. and Emiliyamma K.G. (2015) A checklist of Odonates of Thusharagiri falls, Kozhikode district, Kerala. Malabar Trogon 13 (1): 24–28.

Palot M.J. and Kiran C.G. (2016) Dragonfly survey of Aralam Wildlife Sanctuary, Kannur district, Kerala– A report. Malabar Trogon 14 (1–3): 44–46.

Palot M.J. and Radhakrishnan C. (2005) Faunal diversity of a laterite hill system at Madayippara, Kannur District, Kerala, India. Records of the Zoological Survey of India, Kolkatta. Occ. Paper No: 242: 98 pp + 7 plates.

Palot M.J., Radhakrishnan C. and Soniya V.P. (2005) Odonata (Insecta) diversity of rice field habitat in Palakkad district, Kerala. Records of the Zoological Survey of India 104 (1–2): 71 –77.

Palot M.J. and Soniya V.P. (2004) Studies on the Odonata (Insecta) from a backwater swamp of North

Kerala. Journal of the Bombay Natural History Society 101 (1): 177–180.

Paulson D, Schorr M. and Deliry C. (2021) World Odonata List. https://www.pugetsound.edu/ academics/ academicresources/slater–museum/ biodiversity–resources/dragonflies/ world odonata–list2/ (accessed 7 July, 2021).

Peters G. (1981) Trockenzeit–Libellen aus dem indischen Tiefland. (Trans: Dry season dragonflies of Indian low lands. Description of *Agriocnemis keralensis*). Deutsche entomolgishch Zeitschrift Z.N.F. 28. Heft I–III, Seite 93–108.

Pradeepkumar T., Kakkassery F.K., Samuel A.K., Manoj P., Rao S.P.S., Anvar M. and Kiran C.G. (2014) Report of the First Konni Odonate Survey. Divisional Forest Office, Konni & Tropical Institute of Ecological Sciences, Kottayam. 37pp.

Radhakrishnan C. and Emiliyamma K.G. (2003) Odonata (Insecta) of Kerala: A Systematic database. In: Advances in Insect Biodiversity, Ed. Rajiv. K. Gupta, Agrobios (India), Jodhpur. pp 207–236.

Radhakrishnan C., Gopi K.C. and Palot M.J. (2006) Mangroves and their faunal associates in Kerala, with special reference to Northern Kerala, India. Records of the Zoological Survey of India, Occ. Paper No. 246: 1–81, Plates 1–4.

Raju D.V. (2007) Odonates of Kuttanad wetland ecosystem. Malabar Trogon 5 (1):12 –13.

Rangnekar P., Borkar M. and Dharwadkar O. (2010) Additions to the Odonata of Goa. Journal of Threatened Taxa 2 (4): 805–814.

Rangnekar P., Dharwadkar O., Kalesh S. and Subramanian K.A. (2019) A new species of *Cyclogomphus* Selys, 1854 (Insecta : Odonata : Gomphidae) from the Western Ghats, India, with comments on the status of *Cyclogomphus vesiculosus* Selys, 1873. Zootaxa 4656: 515–524. doi: 10.11646/zootaxa.4656.3.8

Rao K.R. and Lahiri A.R. (1982) First records of Odonata (Arthropoda: Insecta) from Silent Valley and New Amarambalam reserve forests. Journal of the Bombay Natural History Society 79: 557–562.

Roshnath R. (2020) Fauna of Kattampally. State Wetland Authority of Kerala. 140 pp.

Sadasivan K. (2018) Report on Faunal survey of Munnar Wildlife Division, 2018. Travancore Nature History Society, Trivandrum.

Sadasivan K. and Palot M.J. (2021) A note on the current distribution of reedtail damselfly *Protosticta rufostigma* Kimmins, 1958 (Odonata: Zygoptera: Platystictidae) from Western Ghats, and its addition to the odonate checklist of Kerala. Journal of Threatened Taxa 13(1): 17548–17553. https://doi.org/10.11609/ jott.6307.13.1. 17548–17553.

Sadasivan K., Sethumadavan M., Jeevith S. and Kochunarayanan B. (2021) Rediscovery of Martin's Duskhawker *Anaciaeschna martini* (Selys, 1897) (Odonata: Aeshnidae) from Western Ghats, Peninsular India, with notes on its current distribution and oviposition behavior. Journal of Threatened Taxa 13(1): 17543–17547. https:// doi.org/10.11609/jott.6301.13.1. 17543–17547.

Sankar S. (2013) Landscape units: A biogeographical approach to assessment and conservation of biodiversity in the Western Ghats of Kerala. Proceedings of the National seminar on Western Ghats: Biogeography, Biodiversity & Conservation. UGC Sponsored Three Day National Seminar 14 - 16 February 2013. Department of Botany NSS College, Manjeri, Malappuram, Kerala, pp.15-30.

Sharma G., Sundararaj R. and Karibasvaraja L.R. (2007) Species diversity of Odonata in the selected provenances of sandal in Southern India. Zoos Print Journal 22 (7): 2765–2767.

Subramanian K.A. (2007) Endemic odonates of the Western Ghats; Habitat distribution and conservation. In: Odonata –Biology of Dragonflies. Ed. B.K. Tyagi, Scientific publishers, Jodhpur, India. pp 257–271.

Subramanian K.A. (2009) Dragonflies of India – A field Guide. Vigyan Prasar, Department of Science and Technology, Government of India, New Delhi, India.

Subramanian K.A. and Babu R. (2017) A checklist of Odonata (Insecta) of India. Version 3.0. pp 1–51. www.zsi.gov.in.

Subramanian K.A. and Babu R. (2020) Dragonflies and Damselflies (Insecta: Odonata) of India. In: Indian Insects: Diversity and Science, Eds S. Ramani, Prasanth Mohanraj and H.M. Yeshwanth. CRC press, London. pp 29–45.

Subramanian K.A., Kakkassery F. and Nair M.V. (2011) The status and distribution of dragonflies and damselflies (Odonata) of the Western Ghats. In: Status and Distribution of Freshwater Biodiversity in the Western Ghats (Compilers: Molur S., Smith K.G., Daniel B.A. and Darwall

W.R.T.) Cambridge, UK and Gland, Switzerland: IUCN and Zoo Outreach Organization, Coimbatore, India. pp63–74.

Subramanian K.A., Rangnekar P. and Naik R. (2013) *Idionyx* (Odonata: Corduliidae) of the Western Ghats with a description of a new species. Zootaxa 3652 (2): 277–288. http://dx.doi.org/10.11646/zootaxa.3652.2.5.

Subramanian K.A., Emiliyamma K.G., Babu R., Radhakrishnan C. and Talmale S.S. (2018) Atlas of Odonata (Insecta) of Western Ghats, India. Director, Zoological Survey of India, Kolkata.

Subramanian K.A., Babu R. and Emiliyamma K.G. (2020) Insecta: Odonata. In: Faunal Diversity of Biogeographic Zones of India: Western Ghats. Director, Zoological Survey of India, Kolkata. pp227–242.

Susanth C. and Anooj S.S. (2020) Checklist of Odonata of Wayanad District, Kerala, Indian Journal of Entomology 82 (2): 315–323. dx.doi.org/10.5958/0974- 8172.2020. 00072.3

Thumboor R. and Jose J. (2018) *Lestes dorothea* (Fraser) – A new addition to the Odonata (Insecta) fauna of Kerala. Malabar Trogon 16 (2): 17–19.

Thumboor R (2018) *Myristica sapphire* of Athirappally. Malabar Trogon 16 (3): 38 –39.

Varghese A.P., Nikesh P.R. and Mathew J. (2014) Odonata (Insecta) diversity of Salim Ali Bird Sanctuary and its adjacent areas in Thattaekkad, Kerala, India. Journal of Threatened Taxa 6 (6): 5887–5893. http://dx.doi.org/10.11609/JoTT.o3395.5887-93.

van Tol J.(2000) The Odonata of Sulawesi and Adjacent Islands. Part 5. the Genus *Protosticta* Selys (Platystictidae). Tijdschrift voor Entomologie 143: 221–266. dx.doi.org/10.1163/22119434–99900047.

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