

# DRAGONFLIES AND DAMSELFLIES (ODONATA) OF THE EUNGELLA REGION, CENTRAL COASTAL QUEENSLAND, AUSTRALIA

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We collate records of species of dragonflies and damselflies (Odonata) from the broader Eungella region within the Clarke Range, central coastal Queensland, Australia, comprising the Eungella plateau, the upper Pioneer Valley as far east as Gargett, and the area around Eungella Dam on the western side of the Clarke Range. Records are based on specimens collected on Griffith University and Queensland Museum surveys of the region in 2013 and 2014, specimen records in museum collections, and observational records sourced using the *Atlas of Living Australia* and accompanied by identifiable photographs. A total of 58 species are recorded from the Eungella region: 37 dragonflies and 21 damselflies, representing 12 families. Four species appear to be endemic to the Clarke Range. Another six are southern species that occur as far north as Eungella and the broader Clarke Range but do not cross the Burdekin-Lynd Barrier. Two species are essentially confined to northern Queensland and occur south of the Burdekin-Lynd Barrier but only as far south as the Eungella region. The majority of the region's species are widespread, occurring from northern to southern Queensland and often far beyond.

Keywords: dragonflies, damselflies, Odonata, Eungella

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## INTRODUCTION

Within the Central Queensland Coast (CQC), the region extending from just north of the town of Proserpine to south of Sarina, the Clarke Range contains the greatest extent of upland rainforest. The Eungella region is located approximately 60 to 70 km west of the city of Mackay, in the southern part of the Clarke Range. The upland rainforests of the Clarke Range are a centre of endemism for both invertebrates (Morgan, 1988; Monteith, 1997; Colloff, 2010; Holcroft, 2018) and vertebrates (Longmore & Bowles, 1983; Sadlier *et al.*, 2005; Slatyer *et al.*, 2007), although to a much lesser degree than the rainforests of the Wet Tropics bioregion to the north. The significance of the odonate fauna of Eungella was highlighted by Watson & Theischinger (1984), and over the next decade four species were described from the Eungella region, *Episynlestes intermedius* (Theischinger & Watson, 1985), *Austroargiolestes elke*

(Theischinger & O'Farrell, 1986), and *Austroaeschna christine* and *Austroaeschna eungella* (Theischinger, 1993), all of which appear to be restricted to the Clarke Range. The Eungella region is also the northernmost extent of the range of a number of dragonfly and damselfly species (Watson & Theischinger, 1984). Despite its significance, there has been no overview of the region's odonate fauna.

In 2013 and 2014, Griffith University and the Queensland Museum conducted the Eungella Biodiversity Survey, systematic surveys of selected groups of invertebrates, birds and plants spanning the full elevational range of rainforest in the Eungella region, from approximately 200 to 1200 metres above sea level (Ashton *et al.*, this volume). During these surveys, incidental collections of dragonflies and damselflies were also made in a variety of standing and flowing aquatic water bodies in both rainforest

and more open habitats. Based on these collections, specimens in museum collections, and specimens and observational records obtained using the *Atlas of Living Australia* (ALA), we collate the species of dragonflies and damselflies recorded from Eungella and discuss the odonate fauna in terms of the distributions of the species and the region's biogeography.

#### METHODS

This paper collates records of species of dragonflies and damselflies from the broader Eungella region comprising the Eungella plateau, the upper Pioneer Valley as far east as Gargett, and the area around Eungella Dam on the western side of the Clarke Range. Specimens were collected or observed by CJB, EL, ABR and co-workers during combined Griffith University and Queensland Museum (QM) elevational surveys of the region in November 2013, January 2014 and March–April 2014. Odonata were surveyed from rainforest-fringed streams in the lowlands at Finch Hatton Gorge (21°04'S 148°38'E, 220–300 m above sea level (asl)) and Owens Creek (21°04'S 148°41'E, 150–200 m asl). Open habitats in the lowlands were surveyed at Cattle Creek (21°08'19"S, 148°37'47"E, 80 m asl) in the upper Pioneer Valley and Teemburra Dam (21°11'15"S 148°40'10"E, 290 m asl) and Eungella Dam (21°09'04"S 148°22'54"E, 570 m asl). On the highlands of the Eungella plateau, specimens were collected from rainforest streams along Dalrymple Road and on the track to Mt Dalrymple between 885 and 1170 m asl. Specimens were also collected in more open habitats on the plateau: along Broken River (21°10'04"S 148°32'11"E, 700 m asl) in Eungella township (21°07'47"S 148°29'41"E, 700 m asl), and a farm dam at the end of Dalrymple Road (21°02'04"S 148°35'57"E, 980 m asl). Additional specimen records in the collections of the QM were collated by CJB, and those in the Australian Museum (AM) and the Australian National Insect Collection (ANIC) were collated by GT. Three species are recorded from the region based on specimens listed in taxonomic literature (Watson, 1991; Theischinger, 1999). Finally, specimen records, and observational records of species accompanied by identifiable photographs, from the region were also sourced using the *Atlas of Living Australia* (ALA, <https://www.ala.org.au> last accessed 26 September 2018).

The family-level taxonomy for Zygoptera (damselflies) used in this paper largely follows the global systematic consensus of Odonata presented by Dijkstra *et al.* (2013), except that all megapodagrionids are

placed in the Argiolestidae as established by Kalkman & Theischinger (2013). For the Anisoptera (dragonflies), we adopt the more recent classification presented by Carle *et al.* (2015). With respect to the Eungella dragonfly fauna, the classifications of Carle *et al.* (2015) and Dijkstra *et al.* (2013) are mostly in agreement. However, the genera *Austrocordulia* and *Cordulephya* were not assigned to any particular family by Dijkstra *et al.* (2013) and were collectively placed under (libelluloid) 'Genera *incertae sedis*', whereas they were both included within an expanded Synthemistidae by Carle *et al.* (2015).

#### RESULTS AND DISCUSSION

Based on our surveys, specimens in collections (AM, ANIC, QM) and published literature, and observational records obtained using the *Atlas of Living Australia*, a total of 58 species of dragonflies and damselflies representing 12 families are known from the broader Eungella region (Table 1). Dragonflies, with 37 species, outnumber damselflies with 21 species. A brief synopsis of each family is presented below, followed by a discussion of the broader affinities of the odonate fauna of the Eungella region.

##### *Zygoptera – the damselflies*

###### Synlestidae

Synlestids are large damselflies that rest with their wings spread, usually hanging from vegetation along the edges of streams. Two species are known from Eungella. Collections of *Synlestes selysi* from the Eungella region represent the northernmost extent of the range of the species and are highly disjunct from the nearest records from south-eastern Queensland (Bunya Mountains and rainforests of the Sunshine Coast hinterland), separated by around 700 km. The second species, *Episynlestes intermedius*, is endemic to the Eungella region where it has been collected at Finch Hatton Gorge and rainforest streams on the Eungella plateau. *Episynlestes intermedius*, as the name suggests, is intermediate in morphology between its two congeners, *E. cristatus* and *E. albicauda* (Theischinger & Watson, 1985). *Episynlestes cristatus* is restricted to the Wet Tropics bioregion of far north Queensland, separated from *E. intermedius* by the Burdekin-Lynd Barrier (=Paluma-Eungella Gap). Similarly, the St Lawrence Gap separates the range of *E. intermedius* from that of *E. albicauda* which overwhelmingly occurs in subtropical rainforests of south-eastern Queensland and north-eastern New South Wales.

TABLE 1. Dragonfly and damselfly species recorded from the Eungella region, including the upper Pioneer Valley and Eungella Dam. According to their known distributions, species have been classified as: 'endemic', occurring only in the Eungella region and the wider Clarke Range; 'southern', occurring as far north as Eungella and nearby central Queensland rainforests but not beyond the Burdekin-Lynd Barrier (BLB); 'northern', occurring as far south as Eungella but not beyond the St Lawrence Gap; and 'widespread', occurring both north and south of Eungella and often far beyond, i.e. spanning both the BLB and the St Lawrence Gap. An asterisk (\*) indicates species that were collected or observed during recent (2013–2014) Queensland Museum and Griffith University surveys of the area.

| SCIENTIFIC NAME                        | COMMON NAME                 | DISTRIBUTION |
|--|-----------------------------|--------------|
| <b>Suborder Zygoptera</b>              |                             |              |
| Family Synlestidae                     |                             |              |
| <i>Epsynlestes intermedius</i> *       | Intermediate Whitetip       | endemic      |
| <i>Synlestes selysi</i> *              | Forest Needle               | southern     |
| Family Lestidae                        |                             |              |
| <i>Austrolestes leda</i>               | Wandering Ringtail          | widespread   |
| Family Lestoideidae                    |                             |              |
| <i>Diphlebia coerulescens</i> *        | Sapphire Rockmaster         | southern     |
| Family Argiolestidae                   |                             |              |
| <i>Austroargiolestes elke</i> *        | Azure Flatwing              | endemic      |
| <i>Austroargiolestes icteromelas</i> * | Common Flatwing             | widespread   |
| Family Isostictidae                    |                             |              |
| <i>Labidiosticta vallisi</i> *         | Large Wiretail              | widespread   |
| <i>Rhadinosticta simplex</i> *         | Powdered Wiretail           | widespread   |
| Family Platycnemididae                 |                             |              |
| <i>Nososticta solida</i> *             | Orange Threadtail           | widespread   |
| <i>Nososticta solitaria</i> *          | Fivespot Threadtail         | widespread   |
| Family Coenagrionidae                  |                             |              |
| <i>Agriocnemis argentea</i> *          | Silver Wisp                 | widespread   |
| <i>Agriocnemis pygmaea</i> *           | Pygmy Wisp                  | widespread   |
| <i>Argiocnemis rubescens</i> *         | Red-tipped Shade-fly        | widespread   |
| <i>Austroagrion watsoni</i> *          | Eastern Billabongfly        | widespread   |
| <i>Austrocnemis splendida</i>          | Splendid Longlegs           | widespread   |
| <i>Ischnura aurora</i> *               | Aurora Bluetail             | widespread   |
| <i>Ischnura heterosticta</i> *         | Common Bluetail             | widespread   |
| <i>Pseudagrion aureofrons</i> *        | Gold-fronted Riverdamselfly | widespread   |
| <i>Pseudagrion ignifer</i> *           | Flame-headed Riverdamselfly | widespread   |
| <i>Pseudagrion microcephalum</i> *     | Blue Riverdamselfly         | widespread   |
| <i>Xanthagrion erythroneurum</i>       | Red and Blue Damselfly      | widespread   |
| <b>Suborder Anisoptera</b>             |                             |              |
| Family Aeshnidae                       |                             |              |
| <i>Adversaeschna brevistyla</i> *      | Blue-spotted Hawker         | widespread   |
| <i>Anax papuensis</i>                  | Australian Emperor          | widespread   |

| SCIENTIFIC NAME                      | COMMON NAME             | DISTRIBUTION |
|--------------------------------------|-------------------------|--------------|
| <b>Suborder Anisoptera (cont.)</b>   |                         |              |
| Family Aeshnidae (cont.)             |                         |              |
| <i>Austroaeschna christine</i> *     | S-spot Darner           | endemic      |
| <i>Austroaeschna eungella</i> *      | Eungella Darner         | endemic      |
| <i>Austroaeschna pinheyi</i> *       | Inland Darner           | southern     |
| <i>Austrophlebia costalis</i> *      | Southern Giant Darner   | southern     |
| <i>Gynacantha rosenbergi</i>         | Grey Duskhawker         | northern     |
| <i>Telephlebia cyclops</i>           | Northern Evening Darner | southern     |
| Family Gomphidae                     |                         |              |
| <i>Austroepigomphus turneri</i>      | Flame-tipped Hunter     | widespread   |
| <i>Austrogomphus amphiclitus</i> *   | Pale Hunter             | widespread   |
| <i>Austrogomphus cornutus</i>        | Unicorn Hunter          | widespread   |
| <i>Hemigomphus comitatus</i>         | Zebra Vicetail          | northern     |
| <i>Hemigomphus heteroclytus</i> *    | Stout Vicetail          | widespread   |
| <i>Ictinogomphus australis</i> *     | Australian Tiger        | widespread   |
| Family Synthemistidae                |                         |              |
| <i>Austrocordulia refracta</i>       | Eastern Hawk            | widespread   |
| <i>Choristhemis flavoterminata</i> * | Yellow-tipped Tigertail | widespread   |
| <i>Cordulephya pygmaea</i>           | Common Shutwing         | southern     |
| <i>Eusynthemis nigra</i> *           | Black Tigertail         | widespread   |
| Family Corduliidae                   |                         |              |
| <i>Hemicordulia australiae</i> *     | Australian Emerald      | widespread   |
| <i>Hemicordulia intermedia</i> *     | Yellow-spotted Emerald  | widespread   |
| Family Libellulidae                  |                         |              |
| <i>Brachydiplax denticauda</i> *     | Palemouth               | widespread   |
| <i>Crocothemis nigrifrons</i> *      | Black-headed Skimmer    | widespread   |
| <i>Diplacodes bipunctata</i>         | Wandering Percher       | widespread   |
| <i>Diplacodes haematodes</i> *       | Scarlet Percher         | widespread   |
| <i>Diplacodes trivialis</i>          | Chalky Percher          | widespread   |
| <i>Hydrobasileus brevistylus</i> *   | Water Prince            | widespread   |
| <i>Macrodiplax cora</i> *            | Wandering Pennant       | widespread   |
| <i>Nannophlebia eludens</i> *        | Elusive Archtail        | widespread   |
| <i>Nannophlebia risi</i> *           | Common Archtail         | widespread   |
| <i>Orthetrum caledonicum</i> *       | Blue Skimmer            | widespread   |
| <i>Orthetrum migratum</i> *          | Rosy Skimmer            | widespread   |
| <i>Orthetrum sabina</i> *            | Slender Skimmer         | widespread   |
| <i>Orthetrum villosovittatum</i> *   | Fiery Skimmer           | widespread   |
| <i>Pantala flavescens</i> *          | Wandering Glider        | widespread   |
| <i>Rhyothemis graphiptera</i> *      | Graphic Flutterer       | widespread   |

| SCIENTIFIC NAME                    | COMMON NAME              | DISTRIBUTION |
|------------------------------------|--------------------------|--------------|
| <b>Suborder Anisoptera (cont.)</b> |                          |              |
| Family Corduliidae (cont.)         |                          |              |
| <i>Rhyothemis phyllis</i> *        | Yellow-striped Flutterer | widespread   |
| <i>Tramea loewii</i> *             | Common Glider            | widespread   |

#### Lestidae

The family Lestidae is more diverse in southern Australia, and only the widespread, standing water-breeding *Austrolestes leda* has been recorded from the Eungella region, although a couple of other lestid species are likely to occur there.

#### Lestoideidae

This family is represented in the region by a single species, *Diphlebia coerulescens*, one of five species of robust rockmaster damselflies of the genus *Diphlebia* that inhabit streams and rivers of eastern Australia. In the Eungella region, *D. coerulescens* occurs from the lowlands (Owens and Cattle Creeks) to the highlands of Eungella plateau, inhabiting streams in rainforest and more open habitats. There are more northerly records of *Diphlebia coerulescens* from Cathu State Forest, still within the Clarke Range, about 40 km north of the township of Eungella. However, in the Wet Tropics bioregion this species is replaced by the closely allied *Diphlebia euphaeoides*. As with *Synlestes selysi*, there is a substantial gap in the known range of *D. coerulescens*, with around 700 km separating collection records from the Eungella region from the nearest more southerly records from the Conondale Range in the Sunshine Coast hinterland.

#### Argiolestidae

There are ten described species in the genus *Austroargiolestes* which is endemic to eastern Australia. Two species with very different distributional ranges are known from the Eungella region. *Austroargiolestes ictromelas* is the most widespread species in the genus, occurring from the Wet Tropics bioregion to southern Victoria. In the Eungella region it occurs along streams from low elevations (Owens Creek and Finch Hatton Gorge) to the highlands of the Eungella plateau. In contrast, *Austroargiolestes elke* is endemic to the Eungella region and arguably has the smallest range of any species in the genus. It is known from a handful of collections from rainforest at Finch Hatton Gorge, Quandong Creek along the Dalrymple Road, and near Mt Dalrymple.

#### Isostictidae

The family is represented in the region by two relatively widespread species, *Rhadinosticta simplex* and *Labidiosticta vallisii*. Recorded from the Eungella region for the first time in our recent surveys, both species were collected from Broken River, and *L. vallisii* was also collected from Owens Creek. Both species have also been recorded from slightly farther north in the Clarke Range from Cathu State Forest.

#### Platycnemididae

Two species of *Nososticta*, the only genus of Platycnemididae represented in Australia, are known from the Eungella region, *N. solida* and *N. solitaria*. Both inhabit streams and rivers, including riverine pools. On our recent surveys, both species were collected at low to mid-elevations and occurred together in streams in more open habitats such as at Broken River and Cattle Creek, whereas only *N. solitaria* was collected from streams in rainforest at Finch Hatton Gorge and Owens Creek.

#### Coenagrionidae

This is the most speciose family of damselflies worldwide, in Australia and in the Eungella region. Most species in the region inhabit standing water habitats, including small farm dams and larger lakes, riverine pools along sluggish streams, and pools on the edges of faster-flowing streams. The Eungella fauna includes two species of *Argiocnemis* (*argentea* and *pygmaea*), *Argiocnemis rubescens*, *Austroagrion watsoni*, *Pseudagrion microcephalum*, *Xanthagrion erythroneurum*, and two very widespread species of *Ischnura* (*aurora* and *heterosticta*). Two other coenagrionids, *Pseudagrion ignifer* and *P. aureofrons*, are inhabitants of flowing streams and rivers in more open habitats, whereas *P. microcephalum* also inhabits very slow-flowing streams and rivers.

#### Anisoptera – the dragonflies

##### Aeshnidae

Eight species of aeshnids have been recorded from the Eungella region. Of the three species in the subfamily

Aeshninae, two are widespread. *Anax papuensis* is found throughout Australia, while *Adversaeschna brevistyla* is widespread in southern Australia with few records from the tropics. The only record of *A. brevistyla* from the region is a single female collected from a farm dam at the end of the Dalrymple Heights road during our recent surveys. The other aeshnine known from the region, the crepuscular *Gynacantha rosenbergi*, is represented by a single female extracted alive from the grille of a Queensland Parks and Wildlife Service (QPWS) vehicle at Eungella township. *Gynacantha rosenbergi* has been recorded from the Top End of the Northern Territory, and northern Queensland as far south as the southern Wet Tropics bioregion (Theischinger & Endersby, 2009) and, as far as we are aware, this is the only record of the species south of the Burdekin-Lynd Barrier. The QPWS vehicle had been driven from Finch Hatton Gorge to Eungella in the early evening (Harry Hines *pers. comm.*), and almost certainly the specimen had been hit somewhere in the warmer lowlands of the upper Pioneer Valley. *Gynacantha rosenbergi* is very similar to *G. dobsoni*, and we have identified the female specimen as the former species based on the broad ventral regions of its third abdominal tergite, as per the key in Theischiner & Endersby (2009). However, the reliability of this character in separating females of the two species needs further examination and, as such, our identification is provisional at this time.

The five remaining aeshnid species, *Austrophlebia costalis*, *Telephlebia cyclops* and three species of *Austroaeschna*, are included in the subfamily Telephlebiinae, a group with Gondwanan affinities. *Austrophlebia* includes two species of enormous dragonflies that inhabit rainforest streams in eastern coastal Australia. The Eungella region is the northernmost extent of the range of *A. costalis*, which otherwise occurs from eastern Victoria and New South Wales to south-eastern Queensland. The nearest known records to those from Eungella are from the Bunya Mountains and the hinterland of the Sunshine Coast. This species is replaced in the Wet Tropics by *Austrophlebia subcostalis*. *Telephlebia* includes six described species. *Telephlebia cyclops* is known from north-eastern New South Wales and south-eastern Queensland, with apparently isolated, more northerly populations at Kroombit Tops south-west of Gladstone and Eungella.

Of the three species of *Austroaeschna* recorded from Eungella, *A. christine* and *A. eungella* are apparently restricted to rainforests of the Clarke Range. To date, *A. christine* has only been collected from

Finch Hatton Gorge and the Eungella plateau, where it occurs together with *A. eungella* which has also been collected from Cathu State Forest slightly further north. Both species are most closely related to congeners found in south-eastern Queensland and further south (Theischinger, 1993). *Austroaeschna christine* is most similar to *A. sigma* which extends south to the central coast of New South Wales, and *A. eungella* is most similar to *Austroaeschna pulchra* which extends as far south as Victoria. The third species of *Austroaeschna* from the region is known only from two specimens collected on the recent Eungella Biodiversity Survey, one from Broken River and another from Owens Creek. These specimens appear to be *Austroaeschna pinheyi*, a species mainly known from southern inland Queensland (e.g. Carnarvon Range).

#### Gomphidae

The family Gomphidae is represented in the Eungella region by two species of *Hemigomphus*, two species of *Austrogomphus*, one species of *Austroepigomphus* and one species of *Ictinogomphus*. In the Eungella region, *Hemigomphus heteroclytus* is common along rocky streams running through rainforest and more open habitats, and occurs in both the lowlands and higher elevations. This species occurs both north and south of the region, extending into the Wet Tropics and occurring as far south as Victoria and South Australia. In contrast, *Hemigomphus comitatus* is widespread in the Wet Tropics bioregion, with a single collection from Finch Hatton Gorge in the Eungella region representing the southernmost extent of its range. *Austroepigomphus turneri* occurs across northern Australia from the Kimberley region in Western Australia across the Top End of the Northern Territory, and from Cape York Peninsula along the east coast of Queensland south to about Rockhampton. In the Eungella region it is known from a single collection from Dalrymple Creek in the lowlands (Watson, 1991). Of the two species of *Austrogomphus* recorded from the Eungella region, *A. amphi-clitus* appears to be much more common and has been collected from Broken River, Cattle Creek and Owens Creek, and also from Cathu State Forest further north in the Clarke Range. There is only a single record of the second species, *Austrogomphus cornutus*, from the region from "Dalrymple Creek, Finch Hatton" (Watson, 1991). In Australia, the genus *Ictinogomphus* is represented by three species, with only the widespread *I. australis* known from the Eungella region with records from Cattle Creek and Eungella Dam.

### Synthemistidae

Four species of Synthemistidae are known from the Eungella region. *Choristhemis flavoterminalis* is widespread in eastern Australia from the Wet Tropics to the border of Victoria and New South Wales, and has been collected from streams at mid- to low elevations in the Eungella region: Broken River, Cattle Creek and Owens Creek. *Eusynthemis nigra* occurs from the Wet Tropics to north-eastern New South Wales. Two subspecies are recognised, *E. nigra nigra* found north of the Burdekin-Lynd Barrier and *E. nigra xanthosticta* to the south. Specimens *E. n. xanthosticta* from south-eastern Queensland differ in coloration from those of *E. n. nigra* from the Wet Tropics, the former having more extensive yellow markings on the metepimeron and generally showing greater variability in body coloration. Specimens from the Eungella region are considered to be *E. n. xanthosticta*. However, they show variation in the extent of yellow markings on the metepimeron, and some appear closer than others to the 'typical' condition seen in the less variable nominate subspecies. In the region, specimens have been collected from both low and high elevations and as far north as Cathu State Forest.

In the Eungella region, *Austrocordulia refracta* is represented by a single collection of a larval exuvium from low elevation at Dalrymple Creek (Theischinger, 1999) at Mount Charlton, slightly north of Owens Creek. This species, widely distributed in eastern coastal mainland Australia, is likely to be more widespread in the Eungella region as it is encountered uncommonly due to its crepuscular habits. Similarly, *Cordulephya pygmaea* is known from only two collections from the region, one from the 'Eungella Range' and one from Broken River, which represent the northernmost extent of its known distribution. The species is otherwise known to occur from Victoria through eastern New South Wales to south-eastern Queensland, with another isolated record from Carnarvon Gorge. More specimens of *Cordulephya* from the isolated populations at Carnarvon Gorge and Eungella are required to assess if they are indeed conspecific with those from southern Australia.

### Corduliidae

Two species of *Hemicordulia* have been recorded from the Eungella region, with a single collection of *H. intermedia* from Dalrymple Creek. There are more records of the *H. australiae*, with collections from Broken River and the Eungella plateau.

### Libellulidae

This family is the most speciose worldwide and in Australia, as well as in the Eungella region where seventeen species have been recorded. Additional species are likely to occur there. The majority of these species are widespread and associated with standing or sluggish-flowing water habitats such as lakes, ponds and riverine pools. A few species, however, are associated with faster-flowing streams such as two species of *Nannophlebia*, *N. risi* and *N. eludens*, both of which are found along streams at lower elevations in the region. *Diplacodes haematodes* also occurs along streams but prefers backwaters and rockpools.

### General Discussion

Although located within the tropics, floristically the upland rainforests of the Eungella plateau and the broader Clarke Range are northern outliers of the subtropical rainforests of south-eastern Queensland and north-eastern New South Wales. This is also reflected by many faunal groups, both invertebrate and vertebrate, which feature subtropical rainforest species with disjunct populations in the highlands of the Clarke Range that represent the northernmost extent of their geographical ranges (see for example Mahony (this volume) for frogs, Leach *et al.* (this volume) for birds, Burwell *et al.* (this volume) for ants). This is also the case for the odonate fauna, where Eungella and nearby central Queensland rainforests are the northernmost extent of the distribution of a number of rainforest species that otherwise occur in subtropical Queensland and farther south. These include *Telephlebia cyclops* and *Austroaeschna costalis* among the dragonflies, and *Synlestes selysi* and *Diphlebia coerulea* among the damselflies. Two other dragonflies, *Cordulephya pygmaea* and *Austroaeschna pinyhei*, also show this distribution pattern but occur in more open habitats rather than rainforest. The northern populations of some of these species are highly disjunct, separated from their nearest known collection localities in south-eastern Queensland by around 700 km. *Telephlebia cyclops*, however, is known from Kroombit Tops in the intervening region, about 450 km south-east of Eungella, and targeted collecting there and in other patches of subtropical rainforest such as the Many Peaks Range may fill in the large gaps in our knowledge of the distributions of some of these species.

Watson and Theischinger (1984) identified the gap in the Great Dividing Range between the Eungella region and the Paluma Range in the southern Wet

Tropics bioregion as one of a number of areas of 'taxonomic disjunction' for the Australian odonate fauna and other groups of freshwater insects. This 'gap' of low topography and drier open forests separates the rainforests of the Wet Tropics from those of the Central Queensland Coast (CQC). It has long been recognised as a significant biogeographic barrier for the dispersal of rainforest-dependent fauna and is known as the Burdekin-Lynd Barrier (Keast, 1961), referred to as the BLB hereafter. The four rainforest species listed above, for example, do not cross this barrier, and are replaced by closely related congeners in the rainforests of the Wet Tropics north of the barrier. These southern and northern species-pairs that occur on either side of the BLB are *Austrophlebia costalis* and *A. subcostalis*, *Diphlebia coerulescens* and *D. euphaeoides*, *Telephlebia cyclops* and *T. tillyardi* (which is actually closer to *T. tryoni* and *T. undia* from further south), and *Synlestes selysi* and *S. tropicus*. Curiously, there appear to be only two examples of species that show the opposite trend in their distributions, namely *Hemigomphus comitatus* and *Gynacantha rosenbergi*. The former, a stream-dwelling gomphid, is largely confined to the Wet Tropics and is known from a single collection from Finch Hatton Gorge on the southern side of the BLB and has not been recorded further south. Similarly, the specimen of *G. rosenbergi* from the Eungella region is the only record of the species from south of the BLB.

The rainforests of the CQC are also separated from the subtropical rainforests of south-eastern Queensland by a low topography barrier of drier forests, the St Lawrence Gap. This biogeographic barrier appears to have had less influence on rainforest Odonata than the BLB, but their combined influence is likely responsible for the most distinctive element of the Eungella fauna, the four species endemic to the rainforests of the Central Queensland Coast: *Episynlestes intermedius*, *Austroargiolestes elke*, *Austroaeschna christine* and *Austroaeschna eungella*. All four species have closely related congeners in the subtropical rainforests to the south and, in some instances, counterparts in the Wet Tropics to the north. All four are confined to rainforests, usually at higher elevations, but most have also been collected as low as Finch Hatton Gorge where temperatures are perhaps lower than might be expected due to

downslope movement of cooler air and less insolation due to increased shading in the gorge.

The majority of the species found in the Eungella region are widespread species that extend from northern to southern Queensland, across the BLB and the St Lawrence Gap, and often far beyond. Many of these species prefer open habitats and breed in standing waters. This applies to the single lepidid species among the damselflies, and dragonfly species in the families Corduliidae, Aeshnidae (*Anax* and *Adversaeschna*), Gomphidae (*Ictinogomphus*), as well as most of the libellulids. Some stream-dwelling species found in the region are also widespread. Among the damselflies these include *Austroargiolestes icteromelas*, species of *Nososticta* and *Pseudagrion*, and the two isostictids. Widespread stream-dwelling dragonflies include most of the synthemistid and gomphid species, and *Diplacodes haematodes* and the two species of *Nannophlebia* among the libellulids. Many additional species of widespread dragonflies and damselflies are expected to occur in the Eungella region but have yet to be reliably recorded there.

Although the Eungella region, as defined above, has been moderately well collected, the wider Clarke Range and particularly other rainforest areas of the Central Queensland Coast have been poorly surveyed for dragonflies and damselflies. Apart from some collections in Cathu State Forest about 40 km north of the township of Eungella, the northern part of the Clarke Range has been little sampled and the wider distribution of the endemic species that appear confined to the Clarke Range is unknown. Other mountain ranges in the CQC with at least some rainforest are virtually unsurveyed, including the Connors Range west of Sarina, the Conway Range east of Proserpine, and the area surrounding Mt Dryander north of Proserpine. As noted above, many additional widespread dragonfly and damselfly species are expected to occur in the Eungella region. Using the *Atlas of Living Australia*, a search for odonate records from the mainland encompassing Proserpine in the north, Sarina in the south and Eungella Dam in the west revealed reliable records of 16 species in addition to those recorded from the Eungella region. The list of species presented here for the Eungella region is likely to be conservative and far from complete.



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